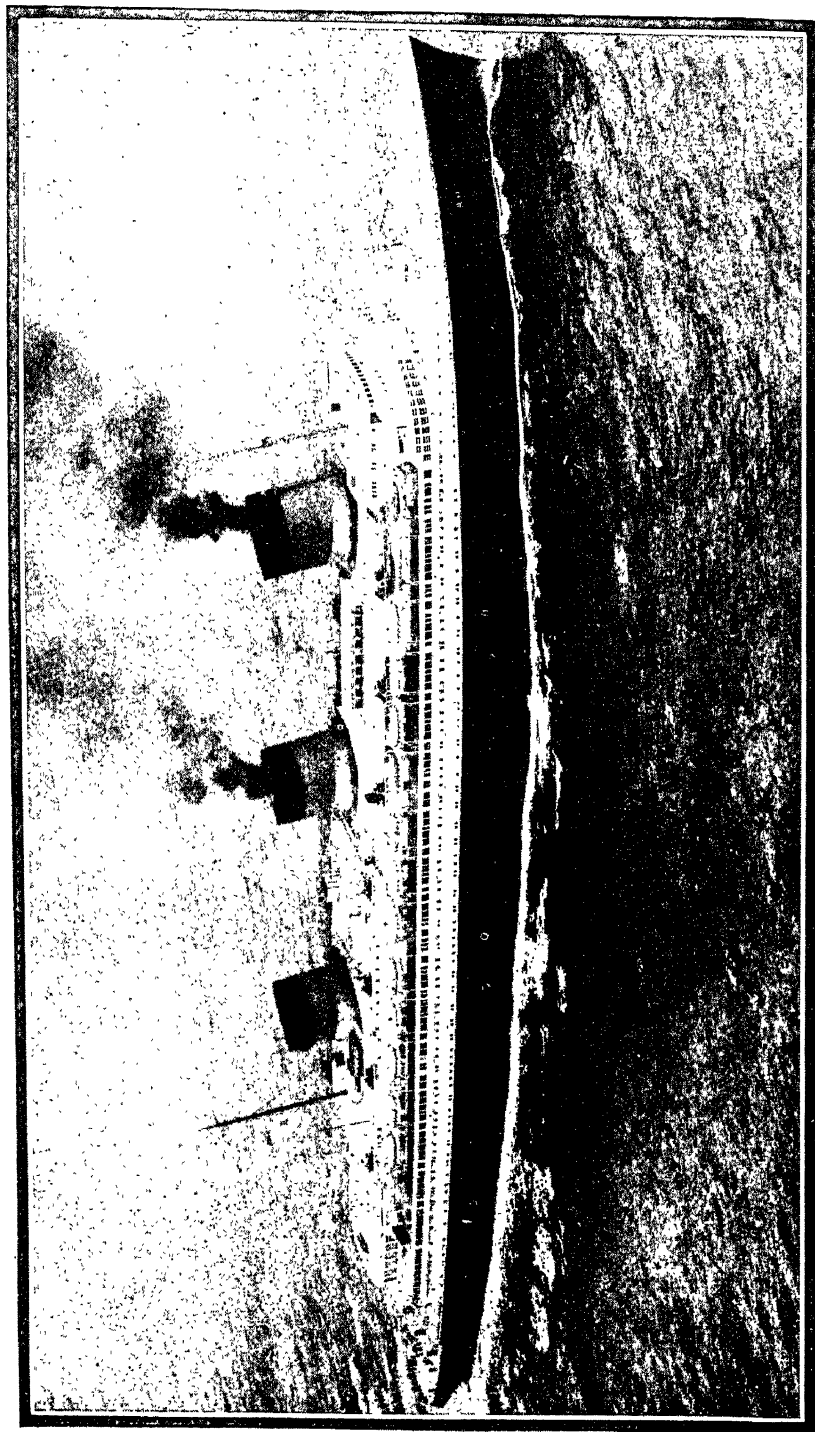


*The*  
HOME UNIVERSITY  
ENCYCLOPEDIA



The Normandie—One of World's Largest Ships



# The HOME UNIVERSITY ENCYCLOPEDIA

—An Illustrated Treasury of Knowledge—

*Prepared under the Editorship of*

C. RALPH TAYLOR

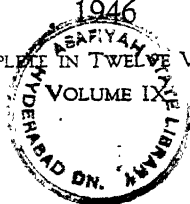
*Advisory Editor*

CARL VAN DOREN

WITH SPECIAL ARTICLES AND DEPART-  
MENTAL SUPERVISION BY 462 LEADING EDITORS,  
EDUCATORS AND SPECIALISTS IN THE  
UNITED STATES AND EUROPE

*(Revised Edition)*

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VOLUME IX



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# VOLUME IX

## Minting

**Minting**, the process by which gold, silver, copper, and other metals are made into coin. The four steps in this process are Assaying, Refining, Alloying, and Coining. Gold and silver are brought to the mint in the form of bullion, old jewelry, etc., or of rough bars. If not already in bar form, the metal is taken to the deposit melting room where it is melted and cast into a rough bar in an iron mould. Two chips are then taken from either end of the bar, and tested by different assayers, who must agree within a stated margin or return the metal to the melting pot to be re-mixed. The metal is first melted by oil furnaces, and then separated by the new electrolytic method. The electric current dissolves the silver and other soluble metals, leaving the gold a brittle mass. By-products such as electrolytic copper, platinum, palladium, and osmiridium are recovered and sold by the Government. The metals now receive their alloys and are cast into ingots. The sweepings and other wastage are carefully collected, and, together with grains and pellets recovered from minor coin operations, are treated in the sweep cellar. The ingots are placed under heavy steel rollers driven by electric motors. The strips thus made are run through a machine in which they are drawn to the exact thickness required. They are next put through the cutting presses, whose steel punches cut out planchets, or blanks, usually two or three at a stroke, slightly smaller and thicker than the finished coin. The blanks are now transferred to the adjusting room where they are put through automatic weighing machines that turn out into separate compartments the coins that are correct in weight, those too light, and those too heavy. The blanks are then annealed preparatory to stamping. They are washed by a new non-acid preparation and are dried. The blank is now ready for the coining press. Fed by a mechanical device into a vertical tube, it is caught and held midway between the upper and lower dies of the press. As soon as the pressure of the dies is removed the completed coin is pushed into a box beneath or beside the press.

After having been carefully inspected on both sides, the coins are counted on automatic counting boards and delivered into bags. The weight and fineness of the coin reserved at the mints are annually tested by

## Mints

an Assay Commission. There are three mints in the United States (at Philadelphia, Denver, and San Francisco), and Assay Offices at New York and Seattle. Also under the direction of the Bureau of the Mint are the gold stores at Fort Knox, Ky., and the silver stores at West Point. The mint at which coins are struck is indicated on gold and silver coins by a small letter under the eagle, or in the case of dimes, under the wreath, as follows: San Francisco, s; Denver, D; Philadelphia, no mark.

The first institution for the coining of money in the United States was established in Philadelphia in 1792, through the efforts of Robert Morris, Washington, Jefferson, and



*Assaying Gold at U. S. Mint, Denver.*

Hamilton. In 1837 and 1873 the mint service was reorganized, in the latter year being made one of the bureaus of the Treasury Department, with headquarters at Washington.

**Minto, Gilbert John Murray Kynynmond Elliot**, Fourth Earl of (1847-1914). British administrator, was born in London. From 1898 to 1904 he was Governor-General

of Canada. In 1905 he succeeded Lord Curzon as viceroy of India, and carried out the Morley reforms. He retired in 1910.

**Minuet**, a stately form of dance, said to have originated in Poitou, France. Beethoven developed the minuet into the scherzo, under which name the movement holds an important position in symphonies and sonatas.

**Minuit**, or **Minnewit**, **Peter** (?1580-1641), first governor of New Netherlands, was appointed (1625) by the Dutch West India Company director general of its possessions in America. On his arrival at Manhattan (May 4, 1626) he is said to have bought the island from the Indians for about \$24 worth of blankets, cattle, and various trinkets. The settlement at New Amsterdam flourished but in 1631 he was recalled by the company. In 1637 Minuit return to the New World, as leader, on behalf of the Swedish West India Company, of a band of Swedes and Finns. A settlement was made on the Delaware River.

**Minute**, in reckoning time, the sixtieth part of an hour, and divided into sixty seconds.

**Minute Men**, in American history the militia who were prepared for service at a minute's notice. The Massachusetts Historical Society has a list of the patriots who were enrolled as Minute Men, wherein appear the names of many later destined to become famous.

**Miocene**, (Greek, 'less recent'), a geological epoch between the Eocene (and Oligocene) and the Pliocene period. In the United States, Miocene strata are to be found along the Atlantic Coast, and in the Gulf region; while fresh-water deposits of the same age are widely spread in the Western States. The Miocene epoch consists mostly of limestones, sandstones, and conglomerates, with lignites and plant beds crowded with vegetable remains, indicating a flora of more tropical character than now exists in the same latitudes. At that time palms seem to have flourished over a large part of Europe. Later on the climate became more temperate. among the more notable terrestrial animals of the Miocene were Mastodon, species of rhinoceros, tapir, fox. The Miocene epoch was one of great changes. To this period is attributed the upheaval which joined together North and South America.

**Miquelon**, **Great** and **Little**, two islands connected by a long, narrow isthmus off the southwest coast of Newfoundland.

**Mir**, **The**, or **Commune**, the name given

to former village communities of peasants in Russia. The village lands belonged to the village in common.

**Mira** (= *o* Ceti), the first-known variable star, discovered by David Fabricius (Aug. 13, 1596).

**Mirabeau**, **Gabriel Honoré Riqueti**, **Count de** (1749-91), French statesman. After he had wasted his own and his wife's fortunes, his father procured a *lettre de cachet*, that led to the imprisonment of the son in the Château d'If, and later at the Château de Vincennes. During his confinement there he studied hard, and wrote the famous *Lettres de Vincennes*. He was liberated at the intercession of his wife. He undertook some secret political work for the French government at Berlin (1786-7)—an experience that led to the compilation of his most solid work, *La Monarchie Prussienne* (1788). Received at Versailles with every mark of distrust, he yet soon exerted his magnetic influence upon men. Louis XVI., Marie Antoinette, and the court looked on him as the most dangerous of the demagogues. Nevertheless Mirabeau threw himself into the debates of the Assembly and of the Jacobin Club, where his speeches were of unequalled power. In May, 1790, LaMarck brought him again into touch with the king, and he began secretly to draw up notes for his advice. To Mirabeau's later plans Louis paid little heed. The great orator lost his hold on the Jacobin Club, and his triumphs in the Assembly were mainly rhetorical and evanescent.

**Miracle Play**, a popular religious play in the middle ages. Strictly the term is equivalent to a play on the subject of a miracle wrought by the Virgin, or by some popular saint; but it is applied also to dialogues or plays on subjects drawn from the Old or New Testament narratives, which are more properly called mysteries. During the 15th century miracle plays were in their heyday: about the middle of the 16th they began to disappear. The reformers thought them profane, and the growth of the professional drama left them old-fashioned.

**Miracles**. Theology, assuming that God is a free, absolute Spirit, whose activity is not exhausted in the laws of nature, and that the world has a spiritual end to which these laws are subservient, defines miracles as a breach of the continuity of nature as known to us, traceable to God and designed by Him to meet some special exigency in the process of revelation. But since the time of Christ the conception of natural law has become as

rigid as may be; hence it is not merely a scientific axiom that miracles do not happen, but it is questioned by many serious minds whether they ever did happen. Thus Paulus saw in them but the misunderstanding and exaggeration of ordinary phenomena. Orthodox Christians, however, maintain that there is no *a priori* improbability that God should supplement, or even in a manner reverse, the workings of natural law by a fresh revelation of His will and character, through miracles. In the Roman Catholic Church, working of miracles are also ascribed to the saints. See also CANONIZATION.

**Mirage**, a delusive appearance due to the rays of light being successively bent in their passage through the air. Sometimes inverted images of distant trees and ships are seen near the horizon beneath the direct images. At other times, especially in hot countries, the ground is lost sight of beyond a certain distance from where the observer is standing, and he sees in its place what appears to be a sheet of water.

**Miranda**, state of Venezuela, bordering on the Caribbean Sea, with an area of 3,068 sq. miles. Coffee, cacao, sugar and beans, bananas and maize are produced; p. 189,572.

**Miranda, Francisco Antonio Gabriel** (c. 1750-1816), Spanish-American soldier and revolutionist, who spent his life in three successive military efforts to free Venezuela and Colombia from the Spanish yoke at the time of the American Revolution and later.

**Miriam**, a sister of Moses and Aaron. She led the choir of women in their celebration of the crossing of the Red Sea.

**Mirror**, a smooth, polished surface, usually of glass, which is capable of reflecting rays of light. Mirrors are used chiefly as an aid to the toilet and for decorative purposes and, in more recent times, in scientific apparatus for the purpose of concentrating or scattering light rays. The Hebrews had mirrors of brass; and mirrors of bronze and silver were used by the Egyptians, Romans, and Greeks. Venice was famous for its glass mirrors introduced into England about 1670, which were made by backing the glass surface with an amalgam of tin and mercury. The first attempt to use silver as a backing was made about 1835. The present process consists of applying to the glass a silver nitrate coating to which ammonia and a solution of tartaric acid is added, and protecting the whole by a coating of shellac and red-lead paint. The parabolic mirror is one which converts a pencil of rays parallel to its axis into a pencil

through its focus. Such mirrors are used in searchlights and similar devices. A concave mirror may be used to bring rays of heat to a focus. Thus used, a mirror is called a *burning mirror*.



*Ancient Greek Mirror, with Figures of Hercules and Athena*

**Mirzapur**, city, United Provinces, India, capital of Mirzapur district, on the right bank of the Ganges; southwest of Benares. It is a well-built city with fine ghats and temples, and is noted for its carpets and brassware; p. 55,000.

**Misamis**, province, Philippines, on the northern coast of Mindanao, between Diuata and Balata Points. The territory of the province is not continuous, the smaller western part being separated from the eastern by Iligan Bay. Its total area is 3,521 sq. miles. Agricultural products include cotton, sugarcane, rice, hemp, chocolate, coffee, tobacco, corn, sweet potatoes, and fruits. Gold, coal, sulphur, copper, and platinum occur, and gums, resinous trees, and valuable timber trees are plentiful; p. 198,943.

**Misappropriation**, the converting to one's own use or benefit, or to the use or benefit of some other than the true owner, of property lawfully in one's possession, but entrusted to one for particular purposes.

**Miscarriage**. See **Abortion**.

**Misdemeanor**, an offense against the criminal law of less degree than a felony. Petty crimes, disorderly conduct, and violation of municipal ordinances and health regulations, are usually classed as misdemeanors.

**Miserere**, ('have mercy'), the 51st Psalm (50th in the Vulgate), generally ascribed to

David. The church has adopted it as the proper language for the expression of penitence.

**Misereres**, called also **Misericords** or **Patiences**, folding seats in the stalls of cathedrals and mediæval churches, often adorned with carvings.

**Misericordia**, or **Brothers of Mercy**, a society of laymen in Florence, founded in 1244, who tend the sick, bury the dead, and perform other charitable offices.

**Mishawaka**, industrial city, Indiana, St. Joseph co., on the St. Joseph River. Water power from the river and a large electric plant are utilized in the manufacture of boots and shoes, furniture, pulleys, veneer goods, flour, windmills, farm implements, wagons, automobiles, and machine-shop and foundry products. The surrounding district produces corn, wheat, oats, rye, and peppermint; p. 28,298.

**Mishna**, the name given to the chief depository of the Jewish 'oral law,' which forms what may be called the text of the Talmud, as distinguished from the Gemara, or commentary. The earliest groupings of the oral law were made by the school of Hillel; but the Mishna, as now extant, was largely collected and arranged by Rabbi Jehuda Hanasi (c. 220 A.D.).

**Misiones**, a rich subtropical territory of the Argentine Republic, in the extreme north-eastern part, between the Paraná and Uruguay Rivers. It is partly mountainous, and is largely covered with a forest of valuable cabinet woods. Area, 11,511 sq. miles; p. 53,563.

**Miskolcz**, town, Hungary. Five m. w. of Miskolcz is the town of Dios-Györ, with great iron and steel works; p. 57,384.

**Mispickel**, an old German name for arsenopyrite, or arsenical pyrites (FeSAs). It is the principal ore of arsenic, and occurs in large quantities in Cornwall, Germany, and the United States.

**Misrepresentation** is distinguished from fraud in that it is an innocent misstatement of fact. Generally, innocent misrepresentations of law, or intention, of motive or object, of value or of opinion, have no effect on a contract.

**Missal**, the book containing the office of the Mass. The missal is largely composed of rubrical instructions of a very minute kind. It was revised in 1604, and again in 1634.

**Missel Thrush**, (*Turdus merula*), a large European thrush, grayish in tint, with bold spots on the under surface. It feeds largely

on berries, especially those of the mistletoe.

**Mission Indians**, a name applied generally to the Indians who came under the control of the Spanish priests who founded the chain of Franciscan 'missions' along the California coast between 1769 and 1823. The remnant now number about 3,000 in Southern California.

**Missions, Christian**, associations for promoting the knowledge and acceptance of Christianity among non-Christian people. The history of missions is the history of the expansion of the Christian Church. From the Crucifixion to the death of John (33-100 A.D.), known as the period of apostolic missions, missionary endeavor was carried on by the apostles and a multitude of other zealous Christians. By 100 A.D. converts had been won in Syria, Asia Minor, Greece, Rome, Alexandria, Babylon, and perhaps in Spain. In the second century the gospel reached Edessa, Parthia, Persia, Media, Bactria, Mauritania, Gaul, Germany, and possibly Britain. Pantænus presided in Alexandria over the first missionary college, and the first historical missionary had gone to 'India' (190)—which may mean Hindustan, Arabia, or Abyssinia. Progress continued in the third century in spite of persecutions, and by 250 A.D. Christians formed perhaps one-twentieth of the subjects of the Roman Empire. Armenia was the first country to adopt Christianity as the state religion.

The fourth century witnessed the final and severest persecution under Diocletian (303), during which British martyrs suffered death at Verulamium, now St. Albans. In 312, after Constantine's conversion, Christianity became the imperial religion. The Goths were enlightened by Ulfilas (c. 311-383), who gave them an alphabet and the Bible in their own tongue. The great light of the fifth century was St. Patrick (c. 387-463), who evangelized Ireland and originated the famous line of Irish-Scottish missionaries, who, during four centuries, carried the gospel and civilization through France, Switzerland, Italy, and Germany. At the close of the sixth century, St. Augustine (596-607), sent by Gregory the Great, visited Britain, and became the first archbishop of Canterbury. During this progress in the West, the Nestorians, though condemned at the council of Ephesus (431), carried on extensive missions in Asia. The conversion of the Northmen was begun in the ninth century, but Denmark was not Christianized till about 1030, under Canute, who also sent missionaries to complete the work

in Scandinavia. The Slavs were evangelized in 861 by Cyril and Methodius of the Greek Church, which also reached the Austrian and Russian Slavs in the tenth and eleventh centuries; and the conversion of Europe was nearly completed by the baptism of Vladimir of Russia and his people in 988.

Modern Protestant missions are usually said to date from the beginning of the eighteenth century. In 1649, under Cromwell, the *Corporation for the Propagation of the Gospel in New England* was formed. John Eliot, the apostle of the North American Indians, was connected with this corporation. The *British Society for the Propagation of the Gospel*, founded in 1701, to minister to English settlers beyond the seas and to propagate the gospel among the heathen, soon undertook a definite work among the Indians and Negroes of North America. Since the early years of the nineteenth century the growth of missionary societies both in numbers and influence has been enormous, while the last quarter of a century has witnessed a remarkable change in methods for the prosecution of missionary enterprise. In the mission field of today the work is of several fairly distinct types or classes: evangelistic, industrial, medical, literary, and educational.

Industrial missionary work has proved of inestimable worth in promoting the idea of the dignity of labor, in advancing moral integrity, in raising the standard of living, in enabling students to support themselves while acquiring an education, and in making possible the self-support of native churches. It differs greatly with the region in which it is carried on. Medical work has shown a tremendous growth, and exerts an irresistible appeal even where evangelistic work finds little sympathy. More than 1,700 hospitals and dispensaries are maintained by Protestant missions in the foreign field and over 2,500,000 patients are treated annually.

To disseminate a knowledge of the Word of God as the basis of a sure and intelligent faith, the translation of the Bible into the vernacular is necessary, and books and tracts must also be prepared. At the present time the Protestant mission presses issue annually over 500,000,000 pages of Christian literature. The various Bible Societies give valuable co-operation in this department of mission work. In India the first Protestant missionaries were the Anglican chaplains sent out by the East India Company in the latter part of the seventeenth century. In 1830 Alexander Duff was sent out by the Established Church of

Scotland. He started what was then a new missionary policy by providing schools in which a liberal education was offered to those who would receive Christian instruction at the hands of missionaries. The American Board of Commissioners for Foreign Missions sent their first missionaries to India in 1812.

Medical missions in India, in the modern sense, date from 1783, when John Thomas, a ship's surgeon, commenced missionary work in Bengal. He later accompanied William Carey, the founder of the Baptist Missionary Society. In 1832 the London Missionary Society sent out Dr. Leitch and about the same time the American Board sent Dr. John Scudder to Ceylon and later to Madras. In Ceylon the Dutch strove to establish the Reformed faith about the middle of the seventeenth century. Early in the nineteenth century (1812) the Baptist Missionary Society sent a missionary to Colombo, and soon afterward Wesleyan, American Baptist, and Episcopalian missionaries arrived. The beginning of Protestant missions in China took place with the arrival of Robert Morrison, a representative of the London Missionary Society sent out in 1807. He labored unceasingly, and practically alone, for twenty-seven years, doing a large amount of literary work and establishing a dispensary over which he placed a qualified Chinese practitioner, and by 1850 there were at least a dozen Protestant missionary societies at work in China. One of the most important missionary agencies in China is the undenominational China Inland Mission, organized in 1865. Many universities and colleges have been founded in China. In no field have medical missions done more for the Christian faith.

The establishment of Protestant missions in Japan followed the signing of treaties made by America, England, and France with Japan in 1858. The next year the Protestant Episcopal Church in America sent two of its clergy to Nagasaki, and these were followed by representatives of the Presbyterian, Dutch Reformed, and American Baptist churches. The early Japanese Christians suffered severe persecution, but by 1873 this virtually ceased and Christian teaching was allowed to go forward unmolested. Christian progress in Japan has been evidenced by the formation of independent, self-governed churches. Doshisha College in Kyoto and St. Paul's in Tokyo are examples of splendid missionary effort.

Christianity in Korea has made rapid ad-

vances in the last decades. The first Protestant missions were started about 1870. Missionary work under most of the different Protestant societies is carried on in the Straits Settlements, Siam, the Dutch East Indies, and the Philippine Islands, the last being opened to Protestant missions upon the annexation of the islands to the United States in 1898. In Asia Minor, Palestine, Arabia, Persia, Baluchistan and Afghanistan missionary work is gradually spreading, particularly along educational and medical lines.

The mission field in Africa embraces practically the entire continent and presents a problem somewhat different from that of any other large mission field. The majority of the inhabitants are less developed socially and intellectually than those of any other continent, and here Mohammedan missionaries are found side by side with the Christians. In Liberia missionary work has been done by the Baptist, Presbyterian, Methodist and Episcopal churches. South Africa is the most promising part of the continent for missionary work. Among pioneers there were Robert Moffat and David Livingstone. All Protestant societies have representatives in South Africa, more than 50 societies being at work there and Protestant Christians numbering over a million communicants. Industrial and medical missions are of the utmost importance. Dr. Patton estimated 10,000,000 Christians in a total population of 130,000,000 for all Africa. In North America missionary endeavor includes work among the Indians, Negroes, and Eskimos, and the foreign population of the great cities. In South America there are Protestant missions in all of the states.

Modern Roman Catholic missions date practically from the foundation of the Jesuit order by Loyola in 1534. Francis Xavier, the most famous of the early Jesuit missionaries, went to Goa in 1542, and labored for ten years in Southern India, the Eastern archipelago, and Japan. His greatest success was in Japan; but the work there was not lasting. In 1622 the *Congregation for the Propagation of the Faith* was founded at Rome; and in 1627 the *College* for the same purpose, and before long the *Congregation of Priests* and the *Seminary for Foreign Missions* in Paris. Important missionary work has been carried on by various religious orders, chief among which were the Jesuits, who worked in all parts of the mission field; the Capuchins in the Levant, North Africa, and South America; the Carmelites in India; the Do-

minicans in Turkey; the Lazarists in China, Persia, the Levant and South America; the Franciscans in China, the Philippine Islands, Egypt, and North Africa. An English society, St. Joseph's Foreign Missionary Society, founded in 1870, carried on work in Uganda and India.

Until the time of the Reformation such missionary work as was undertaken was carried on largely by the Jesuits. In 1523 Loyola went to Cyprus and Jaffa with the intention of converting the Mohammedans, and by his personal teaching and activity aroused the whole Roman Church to a sense of missionary obligation. The Portuguese who reached Ceylon in the sixteenth century introduced Christianity, but when the Dutch arrived in the next century the priests were banished. The Nestorians probably were the first Christian missionaries to reach China. They established schools and churches in the seventh century and were probably active there until the ninth century. In the thirteenth century a Franciscan mission under three friars succeeded in reaching Mongolia but not China. In 1294, however, John of Monte Corvino reached Cambaluc (Peking) and for twelve years labored to spread the kingdom of God. The Bible was translated into Chinese and other literary work was done. In the eighteenth century a decrease of missionary zeal, persecutions, the suppression of the Jesuit order, and the closing of religious houses following the French Revolution caused a decline in the number of Chinese Christians, but in 1830 a revival of Roman Catholic missions in China took place.

Francis Xavier and two companions reached Japan in 1549 and a year later left a Japanese, named Anjiro, in Kagoshima in charge of 150 baptized Christians. Roman Catholic missions are now maintained in Japan, Siam, China, Malay Peninsula, the Philippines, Turkey, Tibet and Mongolia. In Africa there are Roman Catholic missions in Egypt, Algiers, Morocco, Liberia, Dahomey, the Cameroons, and other sections. Roman Catholic missions were founded in North America shortly after its discovery, and for three centuries Spanish missionaries exerted considerable influence in the South and Southwest. Franciscans labored among the Indians of Texas and California and French Jesuits in Canada.

Since the World War the work of Roman Catholic missions has shown remarkable zeal. Pope Pius xi. has manifested a passion for missions in encyclical letters bearing more or



less directly on missionary work, urging an extension of the field, the establishing of a native clergy and a native hierarchy in all lands, and the bringing of Christian education to youth. As a result, increasing support has been given to the three missionary societies especially recommended by the Pope—the Society for the Propagation of the Faith, the Society of the Holy Childhood, and the Society of St. Peter. The Society for the Propagation of the Faith draws more than one-third of its support from the United States, which contributes about \$1,500,000 annually. The Society of the Holy Childhood, as its name implies, works for the nurture and education of children, while the Society of St. Peter supports seminaries for the training of native priests, drawing especially large contributions from Holland and France. The sum of \$87,500,000 paid by the Italian State to the Holy See was largely devoted to missions.

The Roman Catholic missions in China have suffered heavily from civil strife and the Japanese invasion. Many priests were murdered, but recruits at once took their places. Strong anti-Christian sentiment has shown the need of Chinese leadership and in 1926, the first six native Chinese bishops were consecrated. The earnest efforts of Roman Catholics to bring educational opportunities to their missionary fields is illustrated to a marked degree in China and Japan. The Catholic University of Peiping was founded in 1925, the work of the American Benedictines and the La Salle College at Hong Kong and the Catholic University of Tokyo have recently been built.

**Mississippi**, one of the South Central States of the United States, lies between the parallels of  $30^{\circ} 13'$  and  $35^{\circ}$  N. lat., and the meridians of  $88^{\circ} 7'$  and  $91^{\circ} 41'$  W. long. It is bounded on the N. by Tennessee; on the E. by Alabama; on the S. by the Gulf of Mexico and Louisiana; and on the W. by Louisiana and Arkansas, from both of which it is separated by the Mississippi River. The Pearl River marks part of the western boundary. The total area is 46,865 sq. miles, of which 503 are water surface. In general the surface of the State is undulating or hilly. It is crossed from N. to S. by a broad, low ridge, which constitutes the main divide. West of this watershed the surface of the country is broken by several narrow ridges and valleys. At some points along the Mississippi, particularly in the vicinity of Vicksburg and Natchez, series of bluffs rise to the height

of from 200 to 500 ft. To the E. of the divide are the uplands, which rise gradually from an elevation of 150 ft., within a few miles of the coast, to a point in the northeast where some ridges reach an altitude of 600 ft. The entire drainage of the State is into the Gulf of Mexico, about one-half of its area being tributary to the Mississippi River. The most important affluents of the latter are the Big Black and Yazoo Rivers, which form the chief drainage arteries.

The climate is almost subtropical—the seaboard districts having a milder temperature and a heavier rainfall than the northern sections. The soil of the greater portion of the State is composed of deposits of yellow, brown, or reddish loam, and is generally fertile. The Yazoo delta is one of the most productive districts of the Mississippi Valley. The rich bottom lands constitute about one-fifth of the entire area. The State was originally almost entirely covered with forests. The leading industries depending upon the forest products are valued at about \$120,000,000 annually. The State ranks high in yellow pine. Other woods are cypress, dogwood, red gum, oak, ash, yellow poplar, cottonwood, persimmon, tupelo, sycamore, elm, practically all in private ownership.

In value of fishery products, Mississippi is important among the Gulf States. Oysters contributed 47 per cent. of the catch, shrimp, 36 per cent. Biloxi is widely known as a shrimp market. With a soil for the most part of unusual fertility, a warm temperature, and an abundant rainfall, Mississippi is well favored for agriculture. According to the Federal Census for 1930, there were 312,663 farms in the State, comprising an area of 17,332,195 acres, a decrease of 864,784 acres since 1920. Negro farmers outnumbered the white farmers, the figures being 182,888 and 129,775, respectively. Farms operated by owners numbered 77,382; by tenants, 225,617. Cotton is the principal crop, the acreage and yield of this and other important crops annually is about as follows: cotton, 2,600,000 acres, 1,715,000 bales, valued at \$77,175,000; corn, 3,034,000 acres, 48,544,000 bushels, valued at \$30,097,000; hay, 877,000 acres, 1,086,000 tons, valued at \$11,186,000; sweet potatoes, 87,000 acres, 7,743,000 bushels, valued at \$5,807,000. Other important crops are: sugar cane, white potatoes, peanuts, pecans, tomatoes and melons. A wealth of fruits are grown, which includes peaches, apples, pears and plums. Approximately three quarters of a million tons of cotton-

seed is produced each year. Many yams and beans, as well as much sweet corn, are grown for domestic consumption, also for the markets. There is stock raising which includes mules, horses, cattle and hogs, and some dairying. Poultry raising is also considerable.

The Yazoo-Mississippi Delta is said to be the world's choicest cotton growing land. The cotton is planted in April, and cultivated through the late spring and early summer. Picking begins in September and continues through the fall.

systems of the Middle West, and is bordered for practically its entire length by the Mississippi River; while proximity to the port of New Orleans by means of this river places the State in a favorable position for domestic and foreign shipments. Mississippi River traffic is of growing importance since the deepening of the Channel to the city of Minneapolis.

According to the Federal Census of 1940, the population of Mississippi was 2,183,796. Of this total, foreign-born whites numbered



*Mississippi.*

The historic battlefield of Vicksburg, a Confederate stronghold during the Civil War, famous for the long siege resulting in its surrender to General Grant on July 4, 1863. Vicksburg, the third city of Mississippi in size, appears on the banks of the Mississippi River in the background.

Mississippi has various mineral deposits, among which are natural gas, petroleum, coal, gypsum, clay and gravel. The natural gas output, 1940, was 13,000,000,000 cu. ft.

Mississippi's manufactures have more than kept pace with the growth of the population. In 1925 electric power sufficient to run the factories was brought into the State. The lumber and timber industry, one of the oldest in the State, is by far the most important. The transportation facilities of Mississippi are excellent, as the State has direct connection with several large railroad

7,049; Negroes, 1,009,718; Indians, 1,458; Chinese, 561. The urban population in towns and cities of at least 2,500 inhabitants constituted 19.8 per cent. of the total.

Mississippi has a State Board of Education, composed of the secretary of state, attorney general, and superintendent of education. There are separate districts for white and colored pupils, and schools must be open at least four months each year. Attendance is compulsory (since 1918). The revenue is provided by State and local taxation and by interest on State bonds. Institutions for high-

er learning include the following publicly controlled: the University of Mississippi; the Mississippi Agricultural and Mechanical College; the Mississippi State College for Women, at Columbus; and Pearl River Junior College at Poplarville.

The present constitution of Mississippi was adopted in 1890. Among the requirements for voting are residence in the State for two years and in the election district one year (except ministers, six months), the payment of taxes, and registration. In order to register the resident must be able to read, or to interpret, when read, any section of the constitution. The chief executive officers are the Governor, Lieutenant-Governor, Secretary of State, Attorney-General, Auditor, and Treasurer—elected for a term of four years, the first and the last two being ineligible to succeed themselves. The legislature consists of a Senate and a House of Representatives, chosen for a term of four years. Sessions are held biennially, those of every fourth year being called regular, and the other special. Under the Reapportionment Act of 1929, Mississippi has 7 Representatives in the National Congress. Jackson is the State capital.

The early history of Mississippi is closely identified with that of Louisiana, both states being part of the original Louisiana territory. In 1699 Iberville, with 200 French immigrants, established the first settlement in this part of America near the present site of the city of Biloxi, Miss. About a dozen years later the French founded Biloxi, which for a short time was the seat of government of Louisiana; and in 1716 Iberville and Bienville, with a large company of soldiers and immigrants, founded on the present site of Natchez a settlement named Rosalie. Other colonies were attempted at various points, but with small success. In 1763 the French ceded the portion of Louisiana e. of the Mississippi (except New Orleans) to the British, who at the same time received Florida from Spain. In 1781 the region s. of the mouth of the Yazoo and w. of the Chattahoochee—called West Florida under English rule—was conquered by Spain. The treaty of 1783, terminating the Revolutionary War, made the parallel of  $31^{\circ}$  n. lat. the southern boundary of the United States thus leaving the possession of most of the southern part of the present Mississippi a matter of dispute between the United States and Spain. This disputed territory was ceded to the United States by Spain in the treaty of 1795.

In 1798 Mississippi Territory was organ-

ized, embracing most of what is now Southern Mississippi and Alabama. In 1804 it was extended northward to the boundary of Tennessee by the annexation of a vast region which had been considered part of Georgia and South Carolina; and in 1813 the Territory was extended to the Gulf of Mexico by the annexation of a tract (bounded on the w. by the Pearl River) taken from Spain. On Dec. 10, 1817, Mississippi, with its present limits, became a State of the Union, with Jackson as its capital. The remainder of Mississippi Territory was constituted the Territory of Alabama. The first serious slavery agitation in the State followed the passage of the Omnibus Bill in 1850. The news of Lincoln's election was the signal for the calling of a State convention, which on Jan. 9, 1861, passed an ordinance of secession, and Mississippi became one of the Confederate States.

When the Fourteenth Amendment came up for a vote in 1867, it was rejected, whereupon the State was placed under military rule. The ratification of the Fourteenth and Fifteenth Amendments in 1869 was followed by readmission to the Union. For a quarter of a century after the Civil War the energies of the State were expended in recuperation and readjustment to the new economic conditions, and in a struggle with the race problem. By the constitution of 1890 an educational test was introduced, and suffrage was restricted to persons able to read the constitution or interpret a section when read. This provision excluded a large number of Negroes from the suffrage. From the end of the seventeenth to the middle of the nineteenth century the Mississippi River, with its tributaries, was the chief means of communication for the entire Gulf region. Railway development in the latter half of the nineteenth century caused a decline; but in recent years its commercial importance has been increasingly emphasized. In 1938 a State bond issue of \$60,000,000 was authorized for highway and school projects. See MISSISSIPPI RIVER.

**Mississippi Bubble.** See **Mississippi Scheme.**

**Mississippi Catfish, or Blue Catfish** (*Ictalurus furcatus*, or *ponderosus*), is the largest of the American catfish, and has been known to reach a weight of 150 pounds; but large specimens are now rare. It is found chiefly in the Mississippi River.

**Mississippi River** (from the Indian *Miche Sepe*, Great River, or Father of Waters), the greatest river of North America

Its course is wholly within the United States, which it nearly intersects from n. to s., flowing into the Gulf of Mexico. Its drainage area 1,240,000 sq. miles (of which 527,000 sq. miles drain to the Missouri, 171,500 sq. miles to the Upper Mississippi, and 204,000 sq. miles to the Ohio) embraces almost the whole region lying between the Alleghany and the Rocky Mountains.

The Mississippi River proper rises in the lake and swamp region of Northern Minnesota. 1,472 ft. above sea level, in Lake Hernandez de Soto, Becker co., a small lake somewhat beyond Itasca, which was formerly believed to be the source. The total descent from the source to a point just below the Falls of St. Anthony is 744 ft. The basin of the Upper Mississippi contains a large undrained swamp area and numerous lakes. At the Falls of St. Anthony, at Minneapolis, the stream, now 1,200 ft. wide, pitches over a precipice of 18 ft. into a rock-walled gorge of its own cutting and continues over a series of rapids for  $\frac{3}{4}$  mile, in which the total descent is 65 ft. From this point to St. Louis the Mississippi River flows in a gorge with sometimes abrupt cliffs and sometimes retreating walls rising from 200 to 500 ft. above the water level.

From the mouth of the Ohio at Cairo to the Gulf of Mexico the river flows through a broad flood plain and delta—a very low-lying country, largely of its own building. The bottom lands, which form a narrow border along the river in its middle course from St. Paul to St. Louis, below the latter city become extensive and of great economic importance. From the Falls of St. Anthony to the mouth of the Ohio the average descent is a little less than half a ft. to the mile, while below that point to the Gulf the average is approximately three inches to the mile. The lands along the margins of the river and its tributaries constitute the cultivable area. The rest is marsh, which, before the extensive engineering improvements, was subject to periodical inundation.

The Mississippi River is 2,477 miles in length, and is navigable for steamers to the mouth of the Minnesota River, 2.7 miles above St. Paul—a distance of 2,153 miles from the mouth. The Missouri River is longer than the main stream above their junction, and indeed than the entire Mississippi River. From the Gulf to the source of the Missouri's longest head stream is a distance of 4,200 miles, making the Mississippi-Missouri the longest water course on the globe. There are

240 tributaries of sufficient size to deserve location on ordinary small-scale maps, and at least 45 of them are navigable. The central river forms portions of the boundaries of ten States, and twice that number are traversed by its navigable tributaries. Among the cities situated on its banks are Minneapolis, St. Paul, Dubuque, Davenport, Rock Island, Burlington, Quincy, St. Louis, Cairo, Memphis, Vicksburg, Natchez, Baton Rouge, and New Orleans. Bridges cross the river at many of these points, those at Memphis and St. Louis being particularly notable.

In some parts of its lower course the river bed extends far below sea level—even to 100 ft. somewhat n. of New Orleans. Below the junction with the Red River it divides into a number of branches or distributaries, through which the waters reach the Gulf. The waters of the upper Mississippi are clear, but the lower tributaries, especially crossing the great western plains, carry in great quantities of mineral matter in suspension. From such accumulation has been made the immense delta, which is encroaching upon the Gulf at the rate of about 100 yards per year. The Mississippi Valley as a whole is the chief source of America's great agricultural wealth. Farming and stock raising are the leading industries. The variety of its products includes almost every thing that can be grown in the United States.

A basin of such great extent and climatic range possesses unusual capacity for floods. This is a continual source of danger and loss, and a constant call for engineering skill and public expenditure. Destructive floods occurred in 1897, 1903, 1907, 1912 and 1927. In April, 1927, the most disastrous flood in the history of the Mississippi Valley wrought enormous damage, suffering and destruction to thousands of the inhabitants of Illinois, Kentucky, and Mississippi. The total inundated area was estimated at approximately 12,800,000 acres, and the total loss at \$225,000,000. The first measures for flood prevention were taken under the French occupation at New Orleans. Up to the date of the Civil War, the States most concerned had expended \$41,000,000 for such improvements along the lower 2,000 miles of river banks. In 1917 Congress passed the Flood Control Act providing an appropriation for that object and in 1923 a second Flood Control Act extended the scope of the previous Act.

The types of work that have proved useful are the levee, the jetty, the permeable dyke, and revetment work and the impounding of



B-19, soaring skyward, after a 'perfect take-off,' at Clover Field, Santa Monica, Calif. © Press Association, Inc.

waters nearer to the sources of the rivers.

Following the flood of 1927, a mammoth \$325,000,000 plan was adopted by the United States Government for flood control. The new plan included diversion of extra-high flood waters across a natural floodway, where the escape can be controlled. The improvement of navigation on the Mississippi has involved the construction of huge storage reservoirs at Lake Winnibigoshish, Leech Lake,

tion launched by John Law, financier, in 1717. His company acquired rights over the whole territory drained by the Mississippi, the Ohio, and the Missouri. In 1718 the company bought the monopoly of tobacco and the following year it absorbed the East India Company, the China Company, the African Company, and the Senegal Company; and undertook the management of the mint, and the farming of the revenue from the govern-



*Mississippi River. Seen from the air.*

Pokegama Falls, etc.; ice harbors at Dubuque, Davenport, and Quincy; dams at Keokuk, and between St. Paul and Minneapolis; and a channel nine ft. in depth. A general survey of the Mississippi River has been completed and maps of the river published and special surveys of various tributaries have been made. Dredging, which has been done annually since 1895, has now provided a good navigable channel of 9 ft. or more in depth as far as Minneapolis and the program for Mississippi River traffic calls for such a channel to the Great Lakes. Mississippi River floods were again destructive in 1937.

**Mississippi Scheme**, a plan of coloniza-

ment. In this way it controlled the whole colonial trade, and had in its hands the management of the currency and the finance of France. Its failure in 1720 was due to overexpansion and the issue of too much paper money.

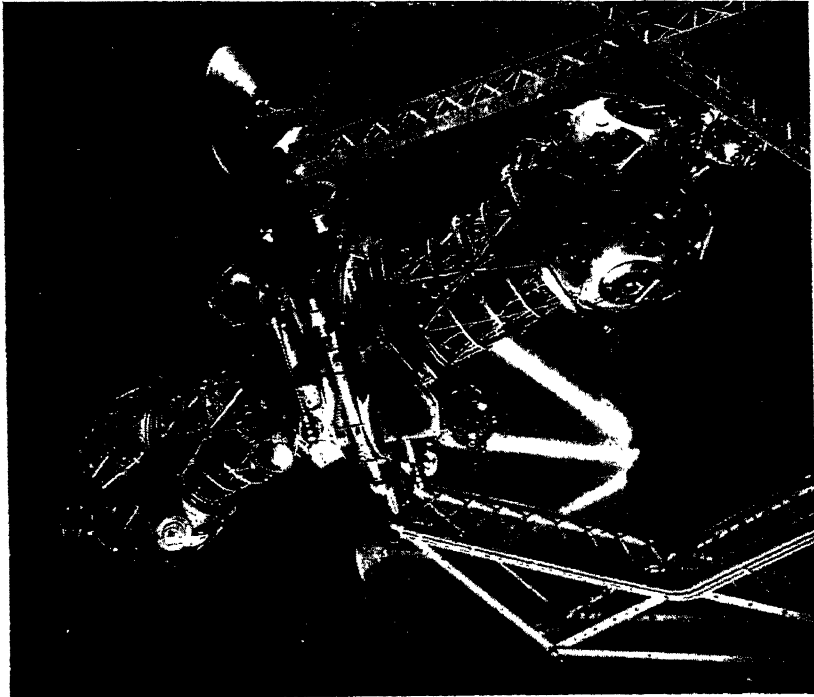
**Mississippi, University of**, a co-educational institution of higher education at University, Miss., chartered in 1844 and opened in 1848. It was founded on the sale of lands granted by Congress at the time of the State's admission into the Union, and is supported by annual appropriations made by the legislature.

**Missoula**, city, Montana, county seat of



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United States Air Infantry in training.



© American Museum of Natural History, N. Y.

Close-up of the huge two-ton Zeiss Projector.

Missoula Co., near the junction of the Bitter Root and Hell Gate Rivers. The State university (University of Montana) is situated here. Besides railway shops of the Northern Pacific Railroad, there are flour mills, saw mills, foundries, and sash and door factories. Near Missoula is located Fort Missoula recently rebuilt; p. 18,449.

**Missouri** (an Indian tribal name, meaning 'muddy water'), one of the North Central States of the United States, lying between the parallels of  $36^{\circ} 30'$  and  $40^{\circ} 35' N.$  lat. (excepting the small portion s. of the first-mentioned parallel, and between the St. Francis and Mississippi Rivers), and  $89^{\circ} 00' 30''$  and  $95^{\circ} 58' 33'' W.$  long., and having the Mississippi River at its eastern boundary. It is bounded on the n. by Iowa, on the e. by Illinois, Kentucky, and Tennessee, on the s. by Arkansas, and on the w. by Oklahoma, Kansas, and Nebraska. The Missouri River marks the northern part of the western boundary, and flows entirely across the State. Its greatest dimension from e. to w. is about 300 miles, and from n. to s. 285 miles. Its total area is 69,420 sq. miles, of which 693 sq. miles are water.

The surface of Missouri falls naturally into three main districts: the upland plains or prairie region in the northern and western part; the Ozark Plateau region, comprising most of the southern and southwestern half of the State; and the small area of lowlands in the southeast, bordering on the Mississippi. The Mississippi River, with a general course to the southeast, forms the entire eastern boundary of the State. Its great tributary, the Missouri, forms the western boundary as far s. as Kansas City, a distance of 200 miles, and crosses the central part of the State to a point twenty miles above St. Louis.

Being far inland, Missouri is subject to the extremes of a continental climate, but the periods of excessive heat and cold are of short duration. The rainfall is most abundant in the southeast. A variety of clays with intermingled strata of sands, marls, and humus form the alluvial bottoms of the two great rivers, and compose a soil deep, light, and remarkably fertile. In the extreme southwest are some of the best wheat and corn lands of the State.

Missouri ranks first among the States in the production of lead, barite and chats, and second in the output of raw clay. Coal production is second in importance in the State. Missouri is the leading coal State in the Southwest. The output is obtained from 31

counties, Barton and Bates leading. The total woodland (not pastured) area in the State is 2,438,358 acres. The trees are mostly hard wood, with a small admixture of pine, and in the lowlands of the s.e. a considerable predominance of swamp cypress. In 1930 there were 255,940 farms in the State, comprising an area of 33,743,019 acres, of which area 15,646,272 acres were crop land. The principal crops, with the average annual acreage and yield of each are: corn, 4,260,000 acres, 106,500,000 bushels, valued at \$50,955,000; wheat, 2,432,000 acres, 31,600,000 bushels, valued at \$18,012,000; hay, 2,214,000 acres, 2,251,000 tons, valued at \$14,406,000; cotton, 368,000 acres, 337,000 bales, valued at \$14,828,000; oats, 1,900,000 acres, 45,600,000 bushels, valued at \$10,032,000; and potatoes, 54,000 acres, 5,832,000 bushels, valued at \$2,916,000. Fruit is grown in considerable abundance. The northwestern part of the State is especially noted for its apples. Watermelons form a large crop. The State ranks high in grape production.

Owing to the variety and abundance of its resources, and its favorable location on the great rivers of the Mississippi Valley, Missouri ranks second among the States w. of the Mississippi in the extent of manufactures. Its prominent position in manufacturing is due largely to the industries of St. Louis and Kansas City. Extensive feeding and grazing areas for cattle in the prairies of Northern Missouri, and for sheep in the Ozarks of Southern Missouri, have been important factors in the development of slaughtering and meat packing, long a leading industry of the State, with products reaching a total of about \$169,000,000 annually during recent years, a figure representing approximately ten per cent of the total of all manufactured products. The Bagnell Dam, on the Osage River in the Ozarks, which creates the world's largest artificial lake, is a hydro-electric power development for delivering power to the two great industrial cities of St. Louis and Kansas City and elsewhere.

In 1937, the State produced 157,631 short tons of lead valued at \$18,600,458.

According to the Federal Census of 1940, the population of Missouri was 3,784,664. Of this total, foreign-born whites numbered 149,390; Negroes, 223,840; Chinese, 634; Indians, 578; Japanese, 94; Mexicans, 4,989; Filipinos, 321. The urban population, in cities and towns of at least 2,500 inhabitants, was 51.8 per cent. of the total.

Missouri has a State Board of Education,



consisting of the governor, secretary of state, attorney-general, and superintendent of public schools. The administration system is completed by county and district boards. School attendance is compulsory for children from seven to fourteen years of age for the entire school term. Separate schools must be maintained for colored children. The University of Missouri, at Columbia, is the highest educational institution in the State. Among the larger private and denominational colleges are Washington University, at St. Louis; St. Louis University; Drury College, at Springfield; Central College, at Fayette; Westminster College, at Fulton.

The present constitution of Missouri was adopted in 1875. Legislative authority is vested in a Senate of 34 members, elected for four years, and a House of Representatives of 150 members, elected for two years. Sessions are held biennially, convening in January of odd years, and are not limited as to length. The principal executive officers are the Governor, Lieutenant-Governor, Secretary of State, Treasurer, Auditor, Attorney-General, and Superintendent of Public Schools, each elected for a term of four years. The governor and treasurer cannot succeed themselves. Under the Reapportionment Act Missouri has thirteen Representatives in the National Congress. The State capital is Jefferson City. The territory now embraced in the State of Missouri was first visited by white men in 1541, when De Soto crossed the Mississippi River below the present site of Memphis, and entered Missouri at New Madrid co., penetrating 200 m. into the Ozark country. It formed a part of that extensive region in the Mississippi Valley acquired by France through the early explorations of Marquette, Joliet and La Salle along the course of the 'Father of Waters.' The earliest settlements were at Saint Genevieve (about 1735), where lead mining was begun, and at St. Louis (in 1764)—the latter early becoming an important fur-trading post.

The territory known as Louisiana was ceded to Spain by the Treaty of Paris in 1763, and remained a Spanish possession until 1800, when it was ceded back to France. During this period the immigration of French from the Northwest Territory to St. Louis was considerable, as was also the immigration from s. of the Ohio, owing largely to the ordinance of 1787, which excluded slavery from the region n. of the Ohio and e. of the Mississippi. In 1795 Daniel Boone removed from Kentucky into Missouri, and aided in

the pioneer development of the State. At the time of the purchase of the Louisiana Territory by the United States, in 1803, there were upward of 9,000 settlers in the region.

This was followed in 1804 by a division of the territory along the parallel of 33° N. lat. The northern portion was constituted the Territory of Louisiana, and the southern portion the Territory of Orleans, the latter division being included in the present State of Louisiana. The northern portion was organized as Missouri Territory in 1812. The immigration during the next two decades was very great—the population increasing from 10,800 in 1810 to 140,400 in 1830. Following the application of the Territory in 1818 to be admitted into the Union as a State, there ensued in Congress a series of heated debates and historic compromises. The Missouri Compromise, approved March 6, 1820, provided for the admission of Missouri as a slave State. A constitution was drafted by a convention in June, 1820. Missouri became a State on Aug. 10, 1821. The period extending from 1820 to the Civil War was marked by rapid settlement and great increase in wealth and social unity.

The election of 1860 resulted in the choice of pro-slavery officers; but a convention called (1861) to consider the relation of the State to the Union voted against secession. The governor refused to accede to Lincoln's call for troops, but summoned the militia to arms in opposition to the Federal troops under Gen. Nathaniel Lyon. The governor and legislature were forced to flee, and the convention established a provisional government. Then followed a spirited military campaign. Missouri was saved to the Union. The reorganization of the State government was completed before the close of the war. In 1875 the present constitution was adopted.

Succeeding years witnessed a great advance in material wealth and prosperity; an immense development of agricultural, mining, and manufacturing resources; and great progress in the provision of educational facilities. In 1904 the Louisiana Purchase Exposition was held in St. Louis to commemorate the one hundredth anniversary of the purchase of Louisiana. Missouri kept pace with other States in social legislation during the early years of the 20th century.

**Missouri Compromise**, effected by the Congress of the United States in 1820, was a measure of great importance in the conflict between those who contended for and those who opposed the further extension of slavery.

By the admission of Alabama to the Union, in 1819, the number of slave States and free States became equal—each group having the same total representation in the U. S. Senate. Before the admission of Alabama, however, Missouri had already (early in 1818) applied for admission as a slave State, and in December, 1819, Maine applied for admission as a free State. These applications occasioned a long and bitter debate in both the House of Representatives and the Senate, the alignment being largely sectional. In accordance with an agreement, arrived at after long dissension, both Houses passed bills (1) admitting Maine, (2) authorizing Missouri to form a State government without any prohibition of slavery, and (3) adopting the Thomas amendment. The Missouri Compromise recognized, in effect, the complete jurisdiction of Congress over the Territories, and allayed for many years the bitterness of the strife in Congress between the representatives of the slave and the free States. The Compromise was formally rescinded by the Kansas-Nebraska Bill of 1854.

**Missouri River**, a river of the United States, the longest branch of the Mississippi. It is formed in Southwestern Montana by the junction of three streams (The Three Forks)—the Jefferson, the Madison, and the Gallatin—which rise in the Rocky Mountains. It serves as the boundary line between Nebraska and Kansas on the w., and Iowa and Missouri on the e., and finally crosses the last-named State to its junction with the Mississippi—20 m. above St. Louis. The total length, from the mouth to the source, is 2,945 m.; while that of the Missouri-Mississippi from the Missouri headwaters to the Gulf of Mexico, is 4,221 m.—1,668 more than the total length of the Mississippi. The drainage basin of the Missouri is about 492,000 sq. m., and the mean annual discharge is 20 cubic m.

The Missouri River is a very rapid stream, noted for its frequent shifting of channel and the extent of scour and fill that attend these changes. From Omaha to St. Louis it flows between bluffs generally about two m. apart. For the greater part of the distance it occupies from one-quarter to one-half of the alluvial bottom, subject to frequent shifting bends, bank erosion, and sand bars which fill it with uprooted trees and other obstructions. Improvements along the Missouri have consisted of levees built by property owners, and of revetments and pile dikes to control and direct the channel, under a plan to establish

a channel 6 ft. deep and 1,200 ft. wide between Kansas City and the mouth. In 1932, this channel was completed, the cost of the project being about \$62,000,000. The Missouri now carries merchandise to and from a rich agricultural country. Commercial activity, promoted by the efforts of the people in the river ports, has increased since 1908 in both the upper and the lower sections of the river. Upstream cargoes consist of merchandise and general supplies; and downstream cargoes of grain and live stock.

The mouth was seen by Marquette and Joliet (1673), and it was partly explored by La Verendrye (1738). The headwaters were first explored, and the river fully mapped and surveyed, in 1896, by a government expedition. In the 18th century the Missouri was active in the fur trade; and in the first half of the 19th, from the introduction of steam vessels to the westward extension of the railroads, it saw its era of greatest prosperity. See MISSISSIPPI RIVER.

**Missouri, University of**, a State institution for both sexes, established at Columbia, Mo., in 1839, and opened in 1841. It comprises a Graduate School, Colleges of Arts and Science and Agriculture, and Schools of Education, Law, Journalism, Medicine, Engineering, and Mines and Metallurgy, Business and Public Administration, Nursing and experiment stations for agriculture, engineering, and mining.

**Mistake**, in the law of contracts, consists in the commission of an act based on a misconception of fact or of law, which act, but for such conception, would not have been committed. It involves lack of real consent, and should be considered from the point of view of intent. It must involve an essential element of the contract.

**Mistassini**, lake, Quebec, Canada, near the watershed which divides the waters of the Saguenay, emptying into the St. Lawrence, from those which flow into Hudson Bay. It is about 120 m. long and 20 m. broad, and contains numerous islands.

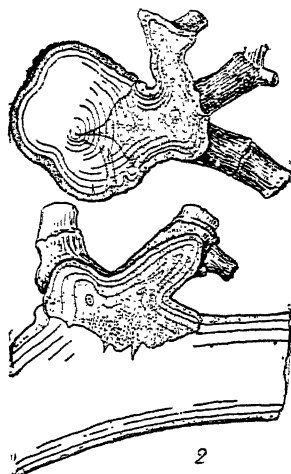
**Mistletoe**, parasitic shrubs (*Viscum*) belonging to the order Loranthaceæ, and found in great bunches on various deciduous trees. The American mistletoe (*Phoradendron flavescens*), found in the Southern States, has broader and shorter leaves and smaller berries and flowers than that of Europe. In the eyes of the Druids the mistletoe was sacred, and used to be cut with great religious ceremony—especially when found growing on the oak.

**Mistral**, the violent n. wind blowing from the cold, snow-covered plateau of Central France down the valley of the Rhône to the Gulf of Lions, the accompanying weather conditions being commonly clear skies and sunshine.



*Branch of Mistletoe.*

**Mistral, Frédéric** (1830-1914), Provençal poet, was born in Maillane. He was educated at the Collège Royale, Avignon. Together with Roumanille he threw himself into a Provençal literary revival, and in 1854 became one of the seven founders of the



*Mistletoe Growing on Branch.*

1, Cross section; 2, longitudinal section.

*Félibrige*, devoted to that object. The rustic epic *Mirèio*, which appeared in 1859, at once placed Mistral at the head of the school, while three later poems of considerable length—*Calendau* (1867), *Nerto* (1884), and

*Lou pouèmo dou rose* (1897)—a play—*La Rèino Jano* (1890)—and a number of short pieces contained enough admirable poetry to sustain his reputation. Mistral spent many years in collecting the proverbs, legends, folklore, etc., of Provence, which he incorporated in his *Trésor dou Félibrige* (1886). In 1904 he shared the Nobel Prize for literature with the Spanish playwright Echegaray.

**Mitchell, John Purroy** (1879-1918), American public official, born in Fordham, N. Y. He was educated at Columbia University and the New York Law School, and was engaged in the practice of law at the time of his first appointment as special counsel to the City of New York (1906). In 1907 he was appointed commissioner of accounts, and in this capacity conducted an investigation which resulted in the removal of two borough presidents. In 1910 he was elected president of the Board of Aldermen, and served as acting mayor for several weeks following Mayor Gaynor's attempted assassination. In 1913 he was appointed collector of the port of New York by President Wilson. In the same year he headed the Fusion ticket in New York City, and was elected mayor by a large plurality for the term 1914-18. Some features of the administration were the city-zoning plan, to relieve congestion in erection of buildings; standardization of employees' salaries, as a result of a thorough study of their work; the 'pay-as-you-go' system, a scientific plan for the city budget; and the adoption of the Gary system for many city schools. Defeated for re-election in November, 1917, by John F. Hyman, Mitchell entered the aviation corps, receiving a major's commission. On July 6, 1918, while practicing over Gerstner Field, Louisiana, he fell to his death.

**Mitchell, Alexander** (1817-87), American financier, was born near Ellon, Aberdeenshire, Scotland. In 1839 he came to the United States. He was commissioner of the Milwaukee debt commission (1861-87), and largely restored the city's credit. He became president of the Milwaukee and St. Paul Railroad Company, which by further incorporation became the Chicago, Milwaukee and St. Paul Railroad Company possessing the greatest mileage of any railroad in the world. He was a Member of Congress (1871-5).

**Mitchell, Donald Grant** ('Ik Marvel') (1822-1908), American author, born in Norwich, Conn. He was in Paris during the third French Revolution (1848), which is described in his *Battle Summer* (1849). Returning to

New York, he issued in parts *The Lorgnette, or Studies of the Town, by an Opera Goer*, which was published in two volumes (1850). It was followed shortly after by his best and most popular book, *Reveries of a Bachelor*. After acting as United States consul at Venice (1853-5), Mitchell bought a farm near New Haven, Conn., and spent there the rest of his life. *My Farm of Edgewood* (1863), *Wet Days at Edgewood* (1865), and *Rural Studies, with Hints for Country Places* (1867), give his impressions of rural life. His later works include: *The Seven Stories with Basement and Attic* (1864); *American Lands and Letters* (1899).

**Mitchell, Elisha** (1793-1857). American scientist, was born in Washington, Conn. He was professor, at the University of North Carolina, of chemistry, mineralogy, and geology. As State surveyor he ascertained that the North Carolina mountains are the highest in the United States, e. of the Rockies. While making observations on Black Dome or Mount Mitchell, the loftiest of these, he was killed.

**Mitchell, Henry** (1830-1902), American engineer, joined the U. S. Coast Survey in 1849, and made important observations on the tides and currents of the Atlantic and Gulf coasts. He was representative of the U. S. Coast Survey at the improvement of the Mississippi mouth in 1874. His scientific papers include *On the Circulation of the Sea through New York Harbor* (1886); *The Under-Run of the Hudson* (1888).

**Mitchell, Henry Bedinger** (1874- ), American educator and author, was born in Babylon, N. Y. He studied in Germany and at Columbia University, and was appointed assistant in mathematics at Columbia in 1898, where he has been successively tutor (1900), adjunct professor (1905), and professor (1908-25) of mathematics. In addition to teaching, he has done important administrative work.

**Mitchell, John** (1870-1919), American labor leader. He began to work in coal mines in Illinois when a fatherless boy of twelve. He joined the Knights of Labor (1885); later became a member of the United Mine Workers of America; and after acting as secretary and treasurer of a sub-district, was president of the organization (1899-1908). He organized the strikes of the anthracite miners in 1900 and 1902, and obtained for them shorter hours and better wages, at the same time averting a strike of the bituminous coal miners. He was a vice-president of the Ameri-

can Federation of Labor from 1899 to 1914 and in the latter year was appointed a member of the Workmen's Compensation Commission of New York State, later becoming chairman of the Industrial Commission of the State of New York. His published works include *Organized Labor, Its Problems, Purposes, and Ideals* (1903); *The Wage Earner and His Problems* (1913).

**Mitchell, Langdon Elwyn** (1862-1935), American author and playwright, was born in Philadelphia. He wrote much under the nom de plume of 'John Philip Varley.' He was Professor of Drama at the University of Pennsylvania. His publications include two volumes of poems (1884 and 1894); the plays *Becky Sharp* and *The New York Idea*; and *Understanding America* (1927).

**Mitchell, Margaret** (1901- ), American writer, born in Atlanta, Ga. In June, 1936, published her first novel, *Gone With The Wind*. The book became a best seller immediately and before Jan. 1, 1937 it had sold nearly a million copies. In private life she is Mrs. J. R. Marsh.

**Mitchell, Maria** (1818-89), American astronomer, was born in Nantucket, Mass. She was educated privately, and early began to assist her father, who was much interested in astronomy and had a small observatory. She discovered a comet (Oct. 1, 1847), for which she received a gold medal from the king of Denmark. In 1858 she visited the principal observatories of Europe, and became acquainted with Sir John Herschel and Sir B. Airy, Verrier of Paris and Humboldt. She was appointed professor of astronomy at Vassar College (1865). During this period she made a special study of sun spots and the satellites of Jupiter and Saturn. She was the first woman to be elected to the American Academy of Arts and Sciences.

**Mitchell, Silas Weir** (1829-1914), American physician and author, was born in Philadelphia, Pa. During the Civil War he became an army surgeon, assuming special charge of soldiers suffering from nervous disorders and injuries affecting the nerves. At the close of the war he continued his work in neurology, and developed the method of treatment in nervous troubles known as the 'rest cure' or 'Weir Mitchell treatment.' Among his popular medical works for general use are *Wear and Tear, or Hints for the Overworked* (1871); and *Doctor and Patient* (1887). His books of fiction include *In War Time* (1885), *Hugh Wynne, Free Quaker* (1897), *Francois* (1899), *Dr. North and His*

*Friends* (1900), *John Sherwood, Ironmaster* (1911), *Westways* (1913).

**Mitchell, William DeWitt** (1874- ), American public official, was born in Winoona, Minn. He took up the practice of law in St. Paul and in 1920 was secretary of the St. Paul Charter Commission. In 1925 he was appointed Solicitor General by President Coolidge and in 1929 was made Attorney-General in President Hoover's cabinet.

**Mitchell, Mount**, a peak of the Black Mountains in Yancey co., North Carolina, height 6,711 ft.—the greatest altitude in the United States e. of the Rocky Mountains. It is named after Elisha Mitchell.

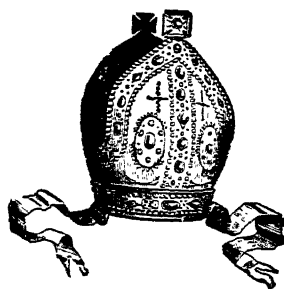
**Mitchill, Samuel Latham** (1764-1831), American scientist, studied medicine in New York, and was graduated from the University of Edinburgh, Scotland (1786). Returning to New York, he studied law, and was appointed a commissioner in connection with the purchase of land in Western New York from the Iroquois Indians (1788), and was elected to the State legislature (1790). He was professor of natural history, chemistry, and agriculture, Columbia College (1792-1801), and made a mineralogical survey of New York State (1795). He was again a member of the New York legislature (1797), and was a member of Congress (1801-4 and 1809-13), and of the U. S. Senate (1804-9). He was professor in the College of Physicians and Surgeons, New York (1808-20); and was vice-president of Queens (Rutgers) Medical College (1826-30). For the extraordinary breadth and diversity of his knowledge he has been called the 'Nestor of American science.'

**Mitford, William** (1744-1827), English historian, was born in London. His chief work was a *History of Greece* (1784-1810), long the standard work on the subject.

**Mithras**, originally one of the three principal gods of the ancient Persians, though later he occupied a position subordinate to Ahura-Mazda (Ormuzd). He was the god of light, external and internal, hence the god of wisdom and of moral purity. After the Persian conquest of Assyria and Babylonia his worship became much more prominent, and Mithras himself was identified with the sun. This religion was introduced into Rome after Pompey's conquest of Pontus, 67 B.C. Between A.D. 100 and 378 it flourished greatly in the Roman empire, but was prohibited in the latter year. Mithraism contended with Christianity for the Roman world more closely than any other pagan cult.

**Mithridates, or Mithradates** (132 or 131 to 63 B.C.), king of Pontus in Asia Minor, was one of the most dangerous enemies of ancient Rome. About 114 B.C. he added to his dominions the kingdom of Bosphorus (the modern Crimea), Cappadocia, and Paphlagonia. In 94 the Romans ordered him to give up Cappadocia. This led to the first Mithridatic War (88 B.C.). After seizing the Roman province of Asia and causing 80,000 Italians to be massacred on one day, Mithridates sent a force over into Greece; but was defeated and made peace in 84. The second war was in 83 and 82, due to the aggressions of Muraena, Sulla's lieutenant. The third war lasted from 74 to 63 B.C. In 66 Pompey defeated and expelled Mithridates, who took refuge in the Crimea.

**Mitre**, the headdress worn by the bishops and sometimes by abbots in the Roman Catholic Church. It consists of a cap with two peaks or horns, and two strings falling over the shoulders, and it came into general use during the 12th century. Originally of simple white linen, and only a few inches high, in the 14th century, it was over a foot high, and adorned with precious stones and gold and silver plates.



*Mitre.*

**Mitre, Bartolomé** (1821-1906), Argentine soldier, journalist, and statesman. He fought in revolutions in Uruguay, Chili, and Bolivia, returned to Buenos Aires to support its independence, and was made president of the new Argentine Republic. He conducted the war of 1865 against Paraguay with the aid of Brazil and Uruguay. About 1852 he established at Buenos Aires his paper *La Nación*.

**Mitropoulos, Dimitri** (1866- ), musician, born in Athens, Greece. He composed the opera *Beatrice*. Has done creditable work in orchestral and chamber music, piano work, songs and orchestral transcriptions. He conducted the Berlin Philharmonic in February,

1930. He visited America in 1936 and conducted the Boston Symphony orchestra and has since conducted symphony orchestras all over the U. S.

**Mixtures** are non-homogeneous substances containing two or more elements or compounds. They are distinguished by the following features: (1) The proportions in which their components can be put together are not fixed; (2) the properties of a mixture are intermediate between the properties of their components; and (3) they can be separated by taking advantage of the difference in properties of their components. For example, common gunpowder is composed of charcoal, saltpetre, and sulphur; varies somewhat in composition; possesses the blackness of the charcoal and the saline taste of saltpetre; and the saltpetre can be dissolved out by water and the sulphur by carbon disulphide, leaving the charcoal.

**Miyadzu**, town, Japan, in the province of Tango, on the west coast of Hondu. It is famed as once being the home of the daimyos, and its fish markets are interesting. In the vicinity is 'Heaven's ridge,' a narrow promontory, one of the 'three great sights' of Japan; p. 10,000.

**Mizar** = ζ Ursæ Majoris, the first telescopic and also the first spectroscopic double star detected. Riccioli, in 1650, discovered its fourth-magnitude companion at 14"; and Pickering, in 1889, found the second-magnitude primary to be composed of two nearly equal white stars, mutually devolving in a period of 20 days, 14 hours (Vogel).

**Mizpeh**, or **Mizpah**, the name of several towns in Palestine. The word 'Mizpah' on memorial rings alludes to the setting up of the heap of stones by Joseph and his brethren at Mizpah of Gilead.

**Mlawa**, town, Poland, in Plock government, 50 m. n.e. of Plock. It has flour mills, breweries, vinegar, soap, and oil manufactures, tanneries, brick works, and agricultural machine works. In the Great War it was captured by the Germans in October, 1914; p. 18,000.

**MM.**, Messieurs, Gentlemen.

**Mme.**, Madame.

**Mnemonics**, a method of assisting one to recall the memory of any series of numbers or words. Cicero, for example, adopted the topical method when he wished to recall the successive parts of a long oration. Choosing some house with which he was entirely familiar, he associated every room and object with some detail of the speech, whether argument,

illustration, or conclusion, proceeding in order from the porch and entrance-hall to the main parts of the building, and assigning the great divisions of his discourse to some of the principal apartments. It was easier to recall the successive parts of the house in proper order, and then set forth the corresponding thoughts and conclusions which had already been deliberately assigned to each, than to recall the latter at first hand. There are many modern memory systems with clever association devices.

**Mnemosyne**, 'memory'—in ancient Greek mythology a daughter of Uranus, and by Zeus the mother of the Muses.

**Moa**, (*Dinornis*) the native name for certain flightless birds which inhabited New Zealand some 500 or 600 years ago. The European occupation of New Zealand about 1835 revealed great numbers of bones of these gigantic birds strewn over the plains and in caves and crevices. There were many species, the largest being about 12 ft. in height, but many were much smaller, one perhaps not bigger than a turkey. The nearest living ally is the small apteryx or kiwi.

**Moab**, the name of an ancient people and a land in Eastern Palestine, east of the Dead Sea and north of Edom. The country is a lofty plateau, abundantly watered and having a rich soil with a semi-tropical vegetation. The people spoke a language akin to Hebrew. Their national deity was Chemosh.

**Moabite Stone**, one of the most important epigraphic memorials of Semitic antiquity, was unearthed at Dibon in 1868. It is of black basalt, rounded at the top and bottom, 2 ft. broad, 3 ft. 10 in. high, and 14½ in. thick, and contains 34 lines in the Phœnician character. The stone, restored as far as possible, is now in the Louvre.

**Mobile**, leading city and only port of entry in Alabama, county seat of Mobile co., is situated on the west bank of the Mobile River at its entrance into Mobile Bay, 30 m. n. of the Gulf of Mexico. It is the port for from 16 to 19 steamship lines, trans-Atlantic, Latin American, and coastwise. Mobile Bay is a commodious, landlocked harbor, 33½ m. long and from 8 to 12 m. broad, and with a main channel 30 ft. in depth. It has a 10,000 ton dry dock. Built on a level sandy plain, with broad rectangular streets, shaded by magnolia and live oak, Mobile presents an attractive appearance. The climate, influenced by prevailing winds from the Gulf of Mexico, is mild in both winter and summer. It is the second manufacturing city of the State.

Manufactures include shipbuilding plants, a large dye extract plant, a packing plant for Guatemalan cattle, a food-products plant, veneer mills using mahogany and Spanish cedars as well as local woods, cotton mills, and paper pulp mills. After shipbuilding and ship repair work, lumber is the principal manufactured commodity, local mills having a capacity of about a million feet daily. The chief items of export are lumber, cotton, naval stores, flour, agricultural implements, barrels and staves, lard and steel. Imports include fruit, mahogany, dyewoods, seal grass, zinc ore, iron pyrites and Cuban molasses (blackstrap) and hides. The total water-borne commerce, foreign and coastwise, is normally in excess of two million tons a year. Mobile was founded in 1702 by Pierre Lemoyne, Sieur d'Iberville, the original settlement being at Twenty-One Mile Bluff, 20 m. above the present city, from which it was removed to its present site in 1710. Until 1720 it was the capital of the French possessions in that part of America. In 1763, by the Treaty of Paris, it came into the possession of England, was taken by Spain in 1780, captured by the Americans in 1813, taken by the English in the same year, and restored to the United States by the Treaty of Ghent. Mobile is the one city in the United States which has been under five different governments, and is sometimes known as the City of Five Flags; p. 78.720.

**Mobile Bay, Battle of**, a naval battle of the Civil War fought in Mobile Bay, Alabama, on Aug. 5, 1864, between a Federal fleet of 7 sloops of war, 7 smaller wooden vessels, and 4 ironclad monitors, under Admiral Farragut and a Confederate fleet of one formidable ironclad ram, the *Tennessee*, and 3 gunboats, under Admiral Buchanan. After the fall of Vicksburg, Farragut determined to take Mobile from the Confederates. As Farragut advanced, Fort Morgan opened fire. The *Tecumseh* was blown up and sank almost instantly. This made the *Brooklyn* pause. The three Confederate gunboats were soon disposed of, and the engagement was between the Federal fleet and the ram *Tennessee*, which surrendered. A few days later the forts surrendered.

**Mobile River**, Alabama, is formed by the junction of the Alabama and Tombigbee Rivers, and divides to form the two channels of Mobile and Tensas. Both branches empty into the head of Mobile Bay, just above the city of Mobile. Length, 50 m.

**Mobilization** is the process of passing from

a peace to war footing. It may be partial or complete. For the purpose of manoeuvres, as a menace, or as a measure of security, an army, a fleet, or a sub-division of either may be mobilized; in which case it is brought up to full war strength, equipped, supplied, and organized for war service. *Complete mobilization* implies the preparation of the whole nation for war.

The procedure for complete military mobilization involves: 1. Notification of mobilization, designating its character, date of commencement (and sometimes of completion), and ordering reservists and others to follow certain instructions in the manual issued to each upon discharge or enrolment. 2. Issuance of other orders affecting and directing mobilization and its details. 3. Declaration of martial law or modified martial law covering the whole country or certain districts.

These actions may take place simultaneously, or in any order, depending upon circumstances. Preparatory instructions covering general features exist as part of the normal preparedness of war; these require merely orders of execution for them to be carried out. Other orders are mostly supplementary, and affect details.

The procedure for complete industrial mobilization involves: 1. Determination of the necessary and essential industries to be maintained as indispensable to the successful prosecution of the war. 2. The determination of the useless or harmful occupations and the elimination therefrom of man power more useful in other fields. 3. The gradual transfer of man power from the useless or harmful occupations and the normal peace time industries to the most essential wartime industries.

**Moccasin**, a shoe worn by North American Indians, varies in different districts. In some it is made of soft leather, sole and upper all in one piece; in others, with a sole of rawhide, slightly turned up all round, and uppers of soft deerskin.

**Moccasin Flower**. See *Lady's Slipper*.

**Moccasin Snake**, **Water Moccasin**, or **Cottonmouth Snake**, a venomous serpent of the rivers and swamps of the Mississippi Valley and Atlantic Coast, from North Carolina and Southern Illinois westward along the Gulf Coast to the Rio Grande. It is of the rattlesnake family but has no rattles, and is nearly related to the copperhead, from which it differs in its aquatic and fish-eating habits, larger size, and dark greenish-black hue, marked by obscure cross bars of black. It

may reach a length of four ft. The interior of the mouth is white and puffy, giving the name 'cottonmouth.' Moccasins never go far from water, and are especially addicted to lying in flooded swamps, on islets and floating logs, or coiled among the branches of bushes overhanging the water, whence they may pounce upon the fish, frogs, or swimming snakes which form their principal fare.

**Mocha**, Arabia. See **Mokha**.

**Mocha Stones**, pieces of agate or of chalcedony, containing dendritic infiltrations, often assuming appearances resembling finely ramified mosses or fern fronds. They were first brought to Europe from Mocha, Arabia. They are also found in North America. They are used as brooch stones, but many of those now sold are produced by artificially coloring natural agates. Of the same nature are *Moss Agates*.

**Mock Heroic Poetry** is that in which mean or trivial subjects are, for the purposes of satire or mere amusement, treated in the serious and elevated style proper to heroic or epic themes. It is a form of parody, and more or less synonymous with travesty or burlesque.

**Mocking Bird**, or **Mocking Thrush**, a genus of birds about the size of the song thrush; the upper parts of a dark brownish ash color, the wings and tail nearly black, the under parts brownish white. By day it is generally imitative, excelling all birds in its power of imitation. It possesses also a song of its own, both strong and sweet, which is most often heard during the twilight or at night. The male is extremely attentive to his mate, and manifests extraordinary courage in driving away enemies from the nest. The range extends from the central United States to Mexico and the Antilles; and is the only American song-bird which has been exported commonly as a cage-bird to Europe.

**Mòd**, **The Gaelic**. The *Comunn Gàidhealach* or Highland Association was founded to promote the study of the Gaelic language, literature, and music. A chief means of carrying out the objects of the association was the institution of an annual gathering, where prizes are offered for excellence in Gaelic reading, recitation, literary compositions in prose and verse, choir and solo singing, and playing on the harp. The official title selected by the Highland Association for these gatherings is *The Gaelic Mòd*.

**Mode**, in music. Ancient Greek music was founded upon a melodic system of diatonic scales termed modes. It was not until about

the 17th century that these old modes were finally superseded by our present forms of major, minor, and chromatic scales.

**Models and Modelling**. A model is an object to be reproduced by imitation. A model may represent a perfect type incapable of reproduction, but furnishing an ideal aim or, as in mathematics, something mentally conceived; or, as in foundries, the actual mould in which a bell is cast. Living persons are employed by artists as models in the various art centres. In geography, globes, maps, and other representations; in sculpture, figures of plastic materials; in anatomy, reproductions of the human form; in mechanical science, machines; in pure mathematics and geometry, models constructed of *papier-maché*, are employed to present to the senses the precise form of figures and curves. Models of yachts, ships, theatres, and other tangible objects are habitually employed for the same reason. The largest collection of models exists in the U. S. Patent Office. For modeling in plastic art, see *Modelling*, by Lanteri (1902).

**Modena**, town, cap. of prov. of Modena, Italy. The cathedral, with a marble tower, was commenced in 1099 by the Countess Matilda of Tuscany; while the palace, built by Francis II. in the 17th century, contains a valuable library. The town is the seat of an archbishop. Modena is exceptionally rich in churches, palaces, and public buildings. Woolen and hempen cloths, hats, and leather are manufactured; p. 91,400.

**Modica**, tn., prov. Syracuse, Sicily. The chief trade is in grain, wine, oil, butter, cheese, and cattle; p. 55,000.

**Modjeska, Helena** (1844-1909), Polish actress, born at Cracow. In 1876 she came with her husband to the U. S. and settled near Los Angeles, Cal., where they hoped to establish a Polish colony, but this plan proving unsuccessful she decided to return to the stage. In San Francisco in 1877, as *Adrienne Lecouvreur*, she met with the greatest success. She repeated this success in New York, and thereafter made frequent tours in England, Poland, and throughout the U. S., making her home in the latter country, where she gained distinction as a tragic actress.

**Modocs**, an Indian tribe, who formerly dwelt on the frontiers of Oregon and California. In 1873 the survivors were removed to the Klamath reservation in Indian Territory. The Modocs speak a stock language, and possess traditions, myths, and animal tales, showing great imagination and even



literary taste. Specimens are given in the *Jour. of American Folklore*, vol. ii., No. 6.

**Modulation**, the process of change from one key into another in a musical composition. At one time modulations were seldom made into other than nearly related keys, but the adoption of the conjoined system of equal temperament and enharmonic changes now gives almost unrestricted freedom to the practice of this device, and many of the greatest effects in modern music are produced by the frequent introduction of skilful modulations.

**Modulus**, in mathematics, a constant referring to properties of matter in certain equations. As stress is proportional to strain within the elastic limits, some constant quantity may be introduced, making this proportionality into an equality. In dealing with strength of materials, such a constant is called a modulus.

**Moe, Jorgen Ingebrektsen** (1815-82), Norwegian author, born in Ringerike, acted as tutor, and spent all his spare time in collecting folk-tales in collaboration with his friend Asbjørnsen. The second edition of the *Folkeeventyr* (1852; Eng. trans. by Dasent, 1859) is provided with a luminous introduction by Moe on the origin and development of the folk-tale.

**Moesia**, ancient Roman province, corresponding to Servia and Bulgaria. When Aurelian surrendered Dacia to the barbarians (272 A.D.), and removed its inhabitants to Moesia, its central parts received the name of Dacia Aureliani.

**Moffett, Cleveland** (1863-1926), American journalist and author, born in Boonville, N. Y. For 10 years he was connected with the New York *Herald* as a writer of special articles, but after 1894 devoted himself to magazine work, chiefly for *McClure's*, the *Century*, *Harper's*, and *Collier's Weekly*. Several collections of his magazine articles have been made under such titles as *Real Detective Stories* (1898) and *Careers of Danger and Daring* (1901). Other works include *A King in Rags* (1907); *The Battle* (1908); *Through the Wall* (1909); *The Bishop's Purse* (1913); *The Conquest of America* (1916); *Possessed* (1920); *Glint of Wings* (1922).

**Mogador, or Suera**, chief seaport of Morocco, on a rocky promontory on the Atlantic coast; 130 m. s.w. of the city of Morocco, of which it is the port. The climate is excellent, and Mogador is noted as a health resort, especially for tuberculous patients; p. 24,000, largely Jewish.

**Mogul, or Mughal**, the Arabic and Persian forms of the word Mongol. The Mogul empire of India (Delhi) was founded in 1526. The emperor of Delhi was generally called the Great Mogul.

**Mohacs**, town, Hungary, on the Danube. It has manufactures of silk, brick, and lumber; p. 17,092.

**Mohair**, a fabric made from the hair of the Angora goat woven with a silk, wool, worsted or cotton warp. It is a somewhat wiry material, sheds dust easily, and wears well.

**Mohammed**, (570-632), the founder of Islam, was born in Mecca, of which city his grandfather, Abd al-Muttalib, was the spiritual and temporal head. Early left an orphan, he was brought up by Abd al-Muttalib and, after his death, by an uncle, Abu Talib. Two factors influenced Mohammed's religious evolution: he was subject to epileptic fits, and was early brought into close intimacy with



Mohammed, the Prophet

Arabian idol worship. His youth was passed tending sheep and camels in the neighborhood of Mecca. At the age of 25 he became the business agent of a widow named Khadija; his integrity and diligence won him her affection, and he married her when he was 26 and she was 40 years of age. It is to this remarkable woman that Mohammed owed much of his success. Her wealth gave him a position of importance, and her devotion encouraged him to believe that he was indeed the apostle of God. Mohammed spent much time in meditation and prayer in a cave on Mount Hira, about 3 m. n. of Mecca. Here his epileptic tendencies induced ecstasies and visions, and one day, about his fortieth year, after a solitary visit, he told Khadija that he had received from the angel Gabriel the first of those messages which were afterwards incorporated in the Koran—a command to preach the gracious revelations

of the one true God. Khadija at once attached a special meaning to the strange visitations which had befallen her husband, and she became his first convert. For 23 years she was Mohammed's sole wife, but after her death in 619, he married 10 wives, besides acquiring concubines and female slaves. Political considerations and the early death of his sons doubtless influenced some of these alliances. Mohammed's earliest labors were among his family and intimate friends, but about 612 he began to teach in public, proclaiming the unity of the God-head, and condemning infanticide, murder, and idolatry. Persistent persecution at length drove Mohammed and his disciples from Mecca to Medina. It is this Hejira, or flight, in July, 622, from which the Mohammedan world computes its era.

As time went on, Mohammed withdrew the concessions he had originally made to those of other faiths. Growing power and success led to loftier claims; coercion was sanctioned when the means of exercising it were achieved; idolaters were to be slain; unbelievers were to be persecuted. In 630 Mohammed and his followers marched upon Mecca, which fell easily and soon became the center of Islam. In 10 years from the Hejira Mohammedanism numbered its adherents by thousands. Mohammed's death took place in 632 in Medina, and there he was buried. Although Mohammed's belief in the reality of his mission never failed, neither regal state nor personal ambition appealed to him. His courage was magnificent, and the loyalty he inspired in his followers is proof of his sincerity. His mental abilities were extraordinary. See MOHAMMEDANISM. Consult Dinet and Ibrahims *The Life of Mohammed and the Prophet of Allah* (1918); Amir Ali's *The Spirit of Islam: a History of the Evolution and Ideals of Islam, with a Life of the Prophet* (1922).

**Mohammed II.** (1430-81), sultan of Turkey, began to reign in 1451. He captured Constantinople (1453), made it his capital, and made many subsequent conquests.

**Mohammed V., Rechad Effendi (Mehmed, or Mehemmed)** (1844-1918), Sultan of Turkey. For 33 years Rechad was kept a prisoner by Sultan Abdul Hamid, but when the revolution of the Young Turks (April, 1909) caused the dethronement and exile of that ruler, Rechad was taken from his palace-prison and placed upon the throne of the Ottoman Empire.

**Mohammedanism, or the faith of Islam,**

the name given to the religion founded in the 7th century by Mohammed. Mohammed taught that the Creator rules the universe with love and mercy; He alone is to be worshipped; in Him confidence may be placed in time of adversity. There must be no murmurings at His decrees; life must be placed in His hands, in trust and love. The fatalism which has come to be regarded as part of the Moslem creed had no place in the system established by Mohammed, who again and again repudiated the idea. Mohammed taught reform, not revolution. Although the idolatry of Arabia was polytheistic, the first part of the formula which has since become the watchword of the Mohammedan faith was but the echo of a prayer common enough among the pagan devotees at the holy shrine in Mecca; and with the establishment of Islam, Mecca retained its sanctity. Once Mohammed was safely established at Medina, there began a departure from the broad philanthropic lines of the original message. The power of success, the zeal of fanatics, and political considerations, while popularizing the creed, ultimately led to that exclusiveness, intolerance, and bigotry which have become such marked features of the faith of Islam. The 'Messenger of God' laid down a plan of salvation based on ceremonial law. Fasts and festivals were proclaimed; stress was laid on pilgrimages, and special blessings were attached to a pilgrimage to Mecca. Later developments changed the attitude of the 'faithful' towards Christians and Jews from one of friendship and toleration to one of aggression and persecution, and this, like other changes, was supposed to be sanctioned by revelation. A holy war, in which a martyr's crown was held out as the reward of those who fell, was to be prosecuted against infidels. Captive women were condemned to slavery or concubinage; polygamy was not only countenanced but encouraged. Notwithstanding the retrogression, the creed spread until before Mohammed's death, in 632, all Arabia acknowledged his spiritual and temporal supremacy. Mohammed himself wrote nothing. The Koran, the scripture of the creed, was compiled after his death. This book not only embraces the whole gospel of Islam and its theology, but it also forms the basis of Moslem law and government; it is the final court of appeal for all Moslems. The Moslem religion has no mysteries, no sacraments, no altars or images, and no intermediaries. There are teachers and preachers, but strictly speaking no priests. Every Mohammedan

mosque has an *Imam* or leader who directs the devotions of the congregations and performs the marriage and burial services and various other functions. Lecturers who expound the Koran and lecture on religion and morals are connected with the larger mosques. Mohammed taught the existence of great numbers of angels of different ranks, as well as of good and evil jinns—creatures of the old Semitic religion and folk-lore. The dead will rise at the last day, and there will be a final judgment of mankind; unbelievers will be condemned to hell; but believers pass immediately at death to paradise, a place of sensual delights conceived by analogy with the green and watered oases of the desert. In the opinion of many scholarly minds, up to the time of the flight to Medina, Mohammedanism did not differ essentially from Christianity and could with truth be considered as a Christian sect but when, after the flight to Medina, Mohammed added to his duties as a prophet and religious teacher those of a warrior and statesman, his religion became an independent system. It now stretches in a broad belt from the Atlantic shores of Africa over all the equatorial and northern part of that continent, through the Turkish dominions, Persia, Turkestan, Afghanistan, India, and the Chinese Empire to the islands of the Pacific. Probably 220,000,000 is a conservative estimate of the number of Mohammedans at the present time; there are several hundred thousands in the Philippine Islands. Consult Clarke's *Ten Great Religions*; Labare's *The Book of Religion and Empire* (1922); Soper's *Religions of Mankind* (1921).

**Moharram**, the first month of the Mohammedan year.

**Mohave**, an Indian tribe of the Yuman linguistic stock living in Arizona and California, on both sides of the Colorado River, just above its mouth, north of the Yuma tribe proper. They are agriculturists and are skilled in basketry and pottery. Consult Bancroft's *Native Races of the Pacific Coast*.

**Mohave Desert**, one of the three divisions of the Colorado Desert, Southern California, lying north of that portion known as the 'Colorado Desert' and south of 'Death Valley.'

**Mohawk River**, rises near the northern border of Oneida co., New York, and flows in a general southeasterly direction to its confluence, at Cohoes, with the Hudson River, of which it is the chief tributary. The falls just above Cohoes are 70 ft. high.

**Mohawks**, the most easterly and most renowned Indian tribe of the Iroquois League, living originally in Northern New York State, especially in the valley of the Mohawk River.

**Mohicans**, or **Mohegans**, an Indian tribe now almost extinct, a branch of the Algonquin family, who shared the territory between the Atlantic coast and the Hudson River with the kindred Narragansetts and Massachusetts. Their name survives in Cooper's *Last of the Mohicans* (1826).

**Mohilev**, or **Moghilev**, White Russia, U. S. S. R. It has spacious streets; a fine town hall (1679); a Roman Catholic church (1692), containing a famous marble group of the *Resurrection* by Antokolski; an orthodox cathedral founded in 1780 by Catherine II.; and a theatre. Leather, tobacco, and pottery are manufactured; p. 53,657.

**Mohl, Hugo von** (1805-72), German botanist, made numerous contributions, chiefly in vegetable anatomy and embryology. His chief works include: *Grundzüge der Anatomie und Physiologie der vegetabilischen Zelle* (1851). He was joint-editor of the *Botanische Zeitung*.

**Mohl, Julius von** (1800-76), German Orientalist, a brother of Hugo von Mohl. Settling in Paris, he studied under De Sacy, and in 1826 was commissioned by the government to edit (1838-68) the *Shāhnāma* of the Persian poet Firdausi. This was his chief work.

**Mohn, Henrik** (1835-1916), Norwegian meteorologist, did valuable work on the subject of storms, carried out researches on the meteorology and oceanography of the Northern Atlantic, and wrote many articles on the climate of Norway. Among his works are *The Norwegian North Polar Expedition* (1905); *Meteorology: Report of the Second Norwegian Arctic Expedition in the 'Fram,' 1898-1902* (1907).

**Mohonk, Lake**, summer resort, New York, Ulster co., in the Shawangunk Mountains, at the north end of Lake Mohonk. The lake is small, but is picturesquely situated at an elevation of 1,200 ft. on Skytop (1,544 ft.).

**Mohr, Carl Theodor** (1824-1901), American botanist and forester, was born in Esslingen, Würtemberg, Germany. In 1880-81 he studied the forests of the Gulf States for the 10th census. In 1890 he was member of the committee which revised the U. S. Pharmacopeia. He published *The Timber Pines of the Southern United States* (1896), and *Plant Life of Alabama* (1901).

**Moiræ**, or **The Fates**, called in Latin *Parcæ*, were the goddesses who presided over human destinies. In art the Moiræ are sometimes represented as old and hideous, but more often as grave maidens. They had places consecrated to them throughout all Greece.

**Moire**, also called watered silk, a heavy silk which is figured by being moistened, folded in a certain way, and then submitted to great pressure by hydraulic machinery; this pressure slowly expels the air and draws the moisture into waved lines, which remain as a permanent pattern on the fabric. Woolen materials are sometimes watered, and are called moiren.

**Moissan, Henri** (1852-1907), French chemist. Moissan's work includes the isolation of fluorine, and a thorough investigation of its compounds; an application of the electric furnace to prepare refractory elements in massive and coherent specimens; to prepare diamonds artificially; and to study the carbides, silicides, borides.

**Moji**, sept. tn., Japan. Its nearness to extensive coal deposits has led to its rapid rise. Much of the export trade has been transferred from Nagasaki to Moji; p. 95,000.

**Mojos**, or **Moxos**, the collective name of a large number of S. American tribes, gathered in the missions about the Mamoré and Beni rivers, Bolivia. They have become industrious agriculturists, and have acquired several arts, and are skilful boatmen.

**Mokha**, or **Mocha**, fort, sept., Arabia, on Red Sea. Most of its former trade in coffee now passes through Hodeida.

**Molasses** is the uncrystallizable syrup obtained in the boiling down of raw sugar. It is a thick, sticky, dark-brown semi-liquid. Molasses from sugarcane is used both for food and to ferment for making rum. It is also obtained in the manufacture of beet-sugar.

**Moldau**, river of Bohemia, rises in the Bohemian Forest, and flows past Prague, until it unites with the Elbe. Length, 270 m., navigable from Budweis to the Elbe.

**Mole**. An insectivorous mammal, the many species of which in various parts of the world constitute the family *Talpidae*. The body is long and narrow, the tail short, the forelimbs placed far forward, and so twisted and modified as to form effective digging implements. The fur is gray, exceedingly soft, fine, and close; there is no external ear, the eye is minute and sunken, the nose is prolonged into a rooting snout, endowed with a very keen

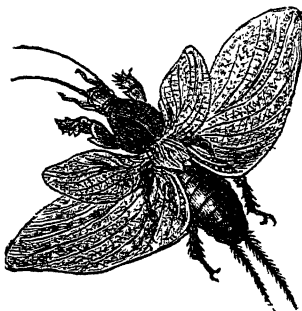
sense of smell, and the teeth are numerous and sharp. Moles live altogether underground, where they move about in summer through the light topsoil (going deeper and sleeping in winter), searching for earth-forms, grubs, and buried insects, upon which



*Mole.*

they voraciously feed. From time to time they come to the surface and throw out a quantity of excavated earth. These deposits are the 'molehills' observable in fields and lawns, where the animals do damage by upheaving the turf, and by making runways for water; but their devouring of wireworms and other insects feeding on the roots of plants is beneficial.

**Mole Cricket**, an orthopterous insect, common in one or another form in all temperate countries. It is related to the true crickets, but is adapted for a subterranean life. The anterior legs are modified into organs for the



*Mole Cricket.*

excavation of the burrow, being short and broad, and bent so as to offer a marked resemblance to the hand of the mole.

**Molech**, or **Moloch**, the tribal deity of the Ammonites, and probably identical with the sungod. The name was originally Melek, 'king'; probably the form Milcom was also primitive.

**Molecule**, from the chemical point of view, the least possible quantity of an element or compound that can exist free—i.e. possess the properties of a mass of the substance. In composition molecules vary from single at-



### TYPES OF APES AND MONKEYS

- |                     |                     |                    |
|---------------------|---------------------|--------------------|
| 1. Diana Monkey.    | 2. Orang-utan.      | 3. Hanuman Monkey. |
| 4. Mandrill Baboon. | 5. Capuchin Monkey. | 6. Spider Monkey.  |



hypocrisy followed in *Don Juan* (1665), which was also bitterly criticized and suppressed. In June 1666, *Le Misanthrope* was produced. This has generally been regarded as Molière's greatest play, though many competent critics prefer *Tartuffe* or the inimitable *Le Bourgeois Gentilhomme*. *Le médecin malgré lui* was also brought out in 1666, and for the next two years a succession of brilliant farces and ballets, of which *Mélicerte le Sicilien*, and *Amphitryon* are the most notable, pleased the public taste. Early in 1669 *Tartuffe* was at last produced in its entirety. In February, 1673, *Le malade imaginaire*, one of the author's finest comedies, was produced. Molière himself acted in this, although ill at the time, and died half an hour after his return from the theatre. Molière ranks but little below Shakespeare in comedy. The gallery of his dramatic portraits embraces almost every social class and well-nigh every professional calling pursued in his day. With an almost uncanny faculty for seizing upon the salient attribute in any character, he possessed a happy gift of emphasizing that without exaggerating it, and thereby throwing the trait out of natural proportion. For wide knowledge of human nature, artistic skill in portraiture, profound acquaintance with stage technique, keen satiric wit, and genial humor, Molière has no rival in the literature of his own land. The standard edition of his works in French is that in *Les Grands Ecrivains de la France* (13 vols., 1873-96); in English, that by Van Laun (1875-7). Consult Trollope's *Life of Molière*; Brander Matthews' *Molière: His Life and His Works*.

**Molina, Luis** (1535-1600), Spanish theologian. His reputation rests chiefly on his *Liberi Arbitrii cum Gratiae Donis . . . Concordia* (1588), in which he attempts to reconcile the doctrine of free will with Augustinian doctrine of the divine decree. The doctrine is still taught in the Jesuit schools. See PREDESTINATION.

**Moline**, city, Illinois, on the Mississippi River. Abundant water power is furnished by the dammed channel between the city and Rock Island in the Mississippi and manufacturing interests are extensive and varied, the products including furniture, organs, elevators, pumps, boilers, structural steel, farm and ironworking machinery, and automobiles; p. 34,608.

**Molinier, Guillem**, Provençal writer, lived in the 14th century, and wrote a *Poetics* of Provençal poetry, under the title *Flors del*

*gay saber* (or, as it is more generally called, *Les leys d'amors*), which he completed about 1355, and which is a valuable source of our knowledge of troubadour poetry.

**Molinism**. See **Molina, Luis**.

**Molino del Rey** (Spanish, 'The King's Mill'), BATTLE OF, a battle of the Mexican War, fought near the city of Mexico, on Sept. 8, 1847, between Americans under General Worth, and Mexicans under Generals Leon, Alvarez, and Perez.

**Molinos, Miguel de** (1640-97), Spanish ascetic and mystic. His *Guida Spirituale* (English translation 1885) was a marvellous success. In 1687, however, Molinos was condemned as a disseminator of Quietism, and sentenced to close imprisonment for life.

**Mollenhauer, Edward** (1827-1914), American violinist, was born in Erfurt, Prussia. In 1850 he joined Julien's band in London as first violin, and in 1853 settled in New York City, where he played and taught, assisted by his brother and nephews. He composed chamber music and the operas *The Corsican Bride* (1861), *Breakers* (1881), and *The Masked Ball*.

**Mollusca**, a large series of invertebrate animals, which includes such forms as snails and slugs (gasteropods), oysters and mussels (lamellibranchs), the pearly nautilus and the cuttles (cephalopods). It was to the cuttles that the name Mollusca was given by Aristotle. A character which at once distinguishes the mollusc from an anthropod or an annelid is the absence of segmentation and of appendages. More important to the systematist than the shell is the mantle, or downgrowth of skin from the dorsal surface, which gives rise to the shell. In almost all molluscs the muscles of the body-wall are greatly developed on the under surface, and protrude to form an organ called the foot, which is primarily concerned with locomotion. It typically contains an important gland, which in the snail secretes the trail of mucus that the animal leaves behind as it creeps, and in the mussel forms the attaching threads (byssus) which fix the animal to the sea-bottom. The nervous system is peculiar, though along its own line it reaches in the higher forms a degree of specialization greater than that found in any other invertebrate. There are three main pairs of nerve-knots or ganglia—the cerebrals, supplying the head region; the pedals, sending nerves to the foot; and the pleurals, supplying the sides of the body. The reproductive organs vary almost infinitely; many molluscs are hermaphrodite, and the

organs are then markedly complex. Mollusca are typically marine animals, and in the ocean live all known cuttles; of lamellibranchs there are many freshwater forms, while gasteropods have succeeded in many instances in successfully colonizing, not only fresh water, but also the land. The diet is very varied. Many gasteropods are vegetarian; many others are, however, actively carnivorous. The lamellibranchs feed on minute organisms filtered from the water. Molluscs are very widely distributed over the globe.

**Molly Maguires**, a secret organization among the anthracite coal miners in N. E. Pennsylvania, existing from the early fifties to the later seventies of the 19th century. The membership, limited to Irishmen, rapidly increased. In 1865 the assassination of a colliery superintendent, attributed to the society, attracted general attention; and a series of murders in the following years introduced a species of terrorism in the region. The organization was broken up, as a result of the work of a Pinkerton detective. James McParlan, who lived with them for three years as a member of the society.

**Moloch** (*Moloch horridus*), a small, squat lizard found in Australia, of great ferocity of appearance due to the sharp spines with which the body is covered. Compare HORNED TOAD.

**Molokai**, one of the Hawaiian Is., Pacific Ocean, set apart as a leper settlement. It was here that Father Damien, a priest, worked to improve the living conditions of the lepers, finally succumbing to the disease himself. Its area is 261 sq. m.

**Molotov, Viacheslav Mikhailovich** (1890- ), Russian public official. He was for many years a member of the Political Bureau of the Communist Party, President of the People's Commissars, and the right hand man of Dictator Joseph Stalin. He was appointed Foreign Minister in May, 1939, and negotiated the Nazi-Russian non-aggression pact; and the pacts which gave Lithuania, Latvia, and Esthonia to Russia. He visited the U. S. June 1942, when the U.S.-Russian mutual aid agreement was signed.

**Moltke, Helmuth Karl Bernhard, Count von** (1800-91), Prussian general. Decentralization throughout the service, perfect preparation to take the field, the arrangement of the Prussian railway system for war, an immense improvement in the constitution of the staff, and the securing of ability in superior commands—these were

the fruits of the genius and labors of Moltke at this time. The powers of this great instrument were first tested in the Danish campaign of 1864, and were made conspicuous in the contest with Austria in 1866. When the war with France broke out in the summer of 1870, the assembling of the hosts of Germany, directed by Moltke, was perhaps the finest example of military organiza-



Count von Moltke.

tion ever seen. Moltke has been described by his countrymen as 'the great strategist'; but his real title to renown is in the organization and preparation of armies, and not in their direction in the field.

**Moluccas, or Spice Islands**, that part of the E. Indies lying between Celebes and New Guinea. They are 43,864 sq. m. in area, consist of two main groups, and have produced spices for centuries; p. 430,855. They were occupied by the Japanese in 1942.

**Molybdenum**, a very hard silver-white metal of specific gravity 8.6. It does not occur native, but is obtained from *Molybdenite*,  $\text{MoS}_2$ , which is its chief ore. *Wulfenite*,  $\text{Pb Mo O}_4$ , is another ore that furnishes a part of the product. The chief use of molybdenum is in the manufacture of certain grades of tool steel.

**Molyneux**. See *Clutha*.

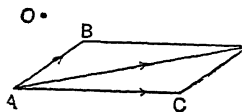
**Molyneux, William** (1656-98), Irish mathematician and philosophical writer, was born in Dublin, where, in 1683, he assisted in founding the Dublin Philosophical Society; member of the Royal Society of England (1685). From 1692 until his death he represented Dublin University in the Irish Parliament. His chief works are *Dioptrica*



*Nova* (1692), *Sciothericum Telescopium* (1686), and *The Case of Ireland* (1698).

**Mombasa**, seapt. and cap. of British E. Africa Protectorate, on e. side of Mombasa I. Mombasa dates from the end of the 15th century, when the Portuguese acquired it.

**Moments.** The moment of a force about a point is the product of the force and the perpendicular distance from the point to the line of action of the force; hence the moment of AB about O is twice the area of the triangle OAB. The same idea applies to any quantity which may be represented by a directed line. A very important proposition in moments is Varignon's theorem—viz. that the sum of the moments of two forces about any point of their plane equals the moment



of their resultant about the same point. Let the conterminous sides of the parallelogram (See Fig.) represent a velocity and its change. If the direction of the change pass through O, its moment about O is zero. Hence, for acceleration directed to a fixed point, the moment of the velocity about that point is constant. If a number of forces act on a body tending to rotate it about an axis, there will be equilibrium if the sum of the moments tending to turn it counter-clockwise (positively) be equal to the sum of the moments tending to turn it clockwise (negatively). Simple examples of this are the lever and the wheel and axle. The same principle gives the supporting forces in cases of loaded beams and trusses.

**MOMENT OF MOMENTUM** about an axis, the product of the momentum and the perpendicular distance from the axis, is more usefully expressed as the product of the moment of inertia and the angular velocity.

**TURNING MOMENTS.**—When a body is being rotated about an axis against a force—e.g. flywheel against a friction brake—there is a turning moment (measured as above) producing the motion which, in the steady state of the above fly-wheel, becomes equal to the frictional moment.

**BENDING MOMENTS.**—The moments of the forces which tend to bend a loaded beam at any section are frequently found graphically.

**Momentum, or Quantity of Motion**, the dynamic quantity which is measured by the product of the mass of a body and its velocity. It is a directed or vector quantity. In the case of a system of particles, the momentum of the whole is equal to the vector sum of the momentums of the parts. Also, as implied in Newton's third law of motion, the momentum of a material system cannot be changed by the action of the forces between its various parts. This important principle is known as the 'conservation of momentum.'

**Mommsen, Theodor** (1817-1903), German classical scholar and historian. He edited the *Corpus Inscriptionum Latinarum*, and also undertook the publication of part of the *Monumenta Germaniae Historica*. In 1902 he received the Nobel prize for literature. Of his numerous works the greatest is his *History of Rome* (1853-6; Eng. trans., new ed. 1911), covering the period from the earliest times to 46 B.C.; supplemented by *Provinces under the Empire* (1887). As a historian he is unequalled for the range of his knowledge, and for his grasp of detail and his vivid presentation of facts. He is less successful in his insight into human character and into political situations, as he is often misled by modern analogies. His worship of Cæsar, and his depreciation of Pompey, Cato, Cicero, and others, are notorious.

**Momordica**, a genus of tropical, climbing, herbaceous plants belonging to the order Cucurbitaceæ. They bear large white or yellow flowers, and fleshy, baccate fruits. They are grown in America as ornamental vines, but the Chinese cultivate *M. Charantia* for the sake of its edible, yellowish fruit. *M. Balsamina* is a more graceful vine, with small, ovoid, orange-colored fruits, called 'balsam apples.'

**Momostenango**, town, Guatemala, Central America. The rich agricultural region produces corn, rice, and beans. Woollen cloth is manufactured.; p. 25,700.

**Monachism.** See **Monasticism**.

**Monaco**, rocky peninsula and coast strip in Southern Europe, forming an independent principality; 9 m. n.e. of Nice. It is 8 sq. m. in area and consists of the towns of Monaco, Monte Carlo, and Condamine. The mild climate and the picturesque scenery make it a favorite tourist resort, but the main attraction is the casino of Monte Carlo. Monaco is the seat of a Roman Catholic bishop, and there is an excellent oceanographical museum opened in 1910. Olive oil, or-

anges, citrons, perfumes and liqueurs are exported. The government is that of a constitutional monarchy. In 1922 Prince Louis II. succeeded his father Albert, as ruler; p. 24,927.

**Monad and Monadism.** Monad is the technical term used by Leibniz to designate the ultimate elements in his metaphysical theory of reality. It must be sharply distinguished from the atom; for while the atom was conceived as extended yet indivisible—a metaphysical contradiction—the monad is a nonspatial qualitative entity. The atom is negative and characterless; the monad is a world in itself, a unity within whose diverse content the whole universe is mirrored.

**Monadnock**, the name given to isolated outliers or remnants of hard rocks that remain standing much above the general level of an area that has been reduced almost to a level by erosion. The name comes from Mount Monadnock, N. H.

**Monadnock, Mount, or Grand Monadnock**, an isolated mountain in the s.w. part of New Hampshire, 10 m. s.e. of Keene. It attains an altitude of 3,86 ft. and is among the most impressive mountains of New England.

**Monaghan**, inland co. of Ireland, in the province of Ulster; area, 500 sq. m. Agriculture is the leading industry, and a small amount of linen is manufactured.; p. 65,131.

**Monarchianism**, a name given to the tenets of those who, before and during the 3d century A.D., opposed the rapidly developing doctrine of the Trinity as endangering or violating the *monarchia* (unity and supremacy) of God.

**Monarchy.** See SOVEREIGN.

**Monarda**, a genus of hardy N. American herbaceous, labiate plants. Perhaps the most useful garden plant is *M. didyma*, the Oswego tea, which bears intensely scarlet flowers in late summer. The wild bergamot (*M. fistulosa*) has flowers of varying tints of white, rose, and purple, but is never scarlet.

**Monastery.** The first monks were solitaries; but when St. Pachomius organized them (c. 340) into communities, it became necessary to provide them with a habitation and a rule—hence the monastery. In the monastery the most stringent rules of obedience and uniformity were exacted. The life of each monastery differed not only according to its rule, but according to national temperament and the character of the abbot. One description runs: 'The Irish monks had so little to do with their brethren in the same

monastery that there is some doubt whether they had even a daily meal in common. Each passed his days and nights in his own little beehive-shaped *claghann*, or cell; the entrance so low as to necessitate the inmate crawling on his knees, the passage so tortuous as to serve as a protection against the winds rushing in.' Compare this with Dean Church's description of the Benedictine monastery of Bec, in Normandy, in the 11th century: 'A monk's life was eminently a social one; he lived night and day in public, and the cell seems to have been an occasional retreat. The cloister was the place of business and conversation, the common workshop, study, and parlor of all. Here the children learned their letters; here was the lecture-room. In a cloister like this the news, the gossip of the world and of the neighborhood, was collected; rumors and stories were reported, picturesquely dressed up and made matter of solemn morals or of grotesque jokes, as they might be now in clubs and newspapers.' Widely apart as these two habits of life may seem, the object of the monastic rule was in every case the same. Dean Church says: 'The governing thought of monastic life was that it was a warfare, *militia*, and a monastery was a camp, a barracks; there was continual drill and exercise, early hours, fixed times, appointed tasks, hard fare, stern punishment, obedience prompt and absolute.'

In a general way, at the head of each community was the abbot. Theoretically he was chosen by the brethren; practically he often was nominated by high outside patronage. He exacted implicit obedience.

Similar establishments for women are termed convents or nunneries, and at the head of each community is the abbess or mother superior. See MONASTICISM.

**Monasticism** arose in the East. Its origin is undetermined, but at a very early date recluses began to shut themselves out from the world and live in solitary retirement. The historian Socrates describes the impetus which was given to this movement in the 3d century by Ammon. This man, being prevailed upon to marry, persuaded his bride that chastity was the highest form of earthly existence; and they both renounced a secular life, living apart, in the exercise of abstinence and prayer. Ammon found many imitators, and the wastes of Nitria and Scetis were soon filled with monks. Of all hermits the name of Anthony is perhaps the best known. He is said to have died about

the middle of the 4th century at the age of 105. Anthony's temptations in the desert became famous, and his austerities were eagerly emulated. So many able-bodied men betook themselves to the wilderness, and thus exempted themselves from the ordinary duties of citizenship, that the Emperor Valens saw fit to withdraw the immunity from military service which had been granted to the 'religious,' and compelled them to serve in his army. The causes for this strange movement were both religious and secular. Withdrawal from the world was thought the surest way to secure salvation. But in addition to this

The itinerant monks played a large part in Christianizing Europe. Monasticism had its patent defects. It produced bigots as well as saints in its earliest developments. The Egyptian monks became a terror to their bishops as well as to all whom they suspected of any want of orthodoxy. (Socrates, bk. vi. ch. 7). See MONASTERY; ABBEY; BENEDICTINES. Wis-hart's *Short History of Monks and Monasteries*.

**Monastir**, or **Bitolia**, town, Yugoslavia. It has numerous mosques, churches, and schools, and is an important garrison town. Grain, hides, woolen cloth, and tobacco are

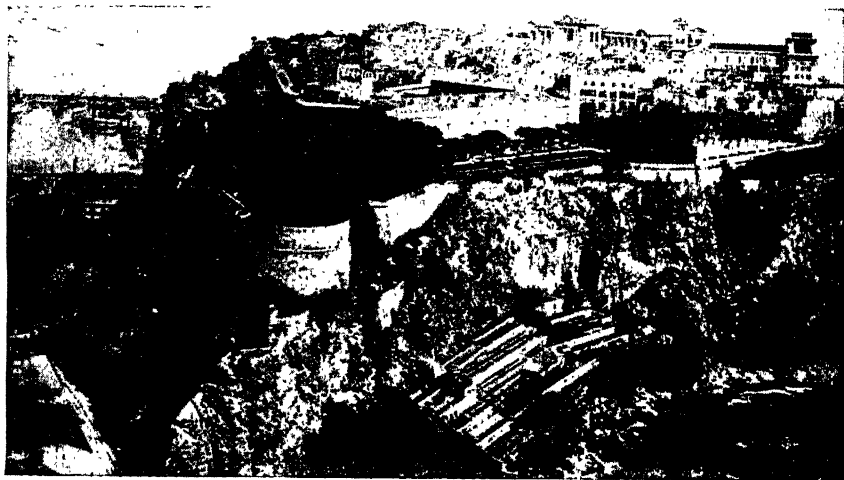


Photo from Underwood & Underwood, N. Y.

*The Principality of Monaco.*

there were certain secular causes. The times were hard. Taxation was intolerably burdensome. Military service was hateful to many. A life of privileged solitude, full of self-imposed hardships, but free and honored, seemed to many the easiest escape from their difficulties. Enthusiasm grew through the legends which soon gathered about the most celebrated hermits, and the writings of Jerome and Cassian made all familiar with the wonders which glorified the more saintly lives. The mediæval monastery played a most beneficent part in the preservation of light in the midst of gross darkness. It afforded a home for the saint, a place of retirement for the scholar, a means of succor for the poor, and taught the ways of peace and order to a strife-torn and lawless world. The peaceful, the gentle, and the feeble found their only refuge in the monastery.

exported. Because of its strategic position at the meeting place of the roads from Salonica, Durazzo, Uskôb, and Adrianople, and because of the fertile lands surrounding it, Monastir is an important military location. On Dec. 2, 1915, it was surrendered to the Bulgarians, from whom it was recaptured on Nov. 19, 1916; p. 29,000.

**Monazite**, an anhydrous phosphate of the rare earth metals cerium, lanthanum, didymium, and thorium. It is a yellow or brown mineral occurring originally in the form of small grains and crystals. The world's supply has come for many years from Brazil, North and South Carolina, and Idaho. Monazite is of value chiefly as the source of thorium ( $\text{ThO}_2$ ), which is widely used in the manufacture of mantles for incandescent gas lights.

**Monck (Monk) George**, First Duke of

Albemarle (1608-70), British general and admiral. Lieutenant-general under Cromwell, he distinguished himself at Dunbar (1650), and acted successfully as admiral against the Dutch (1635). After Cromwell's death, he entered England (1660) with 6,000 men, and restored Charles II. Monck now was made duke of Albemarle, and entrusted with the highest offices in the state.

**Moncton**, town and port of entry, New Brunswick, Canada. Oil and natural gas are found nearby, and there is trade in agricultural and lumber products. There are railway shops here and manufactures of cotton, flour, planing mill, foundry, and machine shop products, building materials, leather and woodenware, underwear, hats, and aerated waters; p. 20,600.

**Mond, Ludwig** (1839-1909), chemist, was born at Kassel, Germany. His most important work lay in the development of chemical industry in Great Britain, particularly by the introduction of the ammonia-soda process of manufacturing sodium carbonate, and by the production of a producer gas from useless slag.

**Mondovi**, town, Piedmont, Italy. Its chief features are an old citadel (1573) and a cathedral (1450).

**Monel Metal**. See **Nickel**.

**Monet, Claude Oscar** (1840-1926), French impressionistic painter, was born in Paris. The Impressionists were so named from Monet's painting, *Impression: Soleil Levant*. For years Monet suffered hostile criticism and bitter ridicule, but after 1880 the attitude of the public changed, and his fame became established. His subjects are taken directly from nature; and his work is characterized by strong individuality, pictorial unity, and above all by the remarkable delineation of subtle gradations of light and of atmospheric effects. Among his best known works are his numerous 'series,' each of 12 or 15 paintings portraying the same object under varying conditions of color, light, and air. These include the *Haystack Series*, the series of the *Rouen Cathedral*, *The Poplars*, *Water Lilies*, *Views on the Thames*, *Morning on the Seine*, *Rocks at Belle Isle*, and several Venetian series. See IMPRESSIONISM. Consult Duret's *Monet and the French Impressionists* (1912).

**Moneta, Ernesto Teodoro** (1833-1918), Italian editor and pacifist. After 1870 he founded numerous peace societies in Northern Italy. Among his writings was *Le guerre, le insurrezione, e la pace nel secolo XIX* (3

vols.), for which he was awarded half the Nobel Peace Prize for 1907.

### **Monetary Conferences, International.**

The first of the international conferences was held at Paris at the call of the French government, on the occasion of the Paris Exhibition of 1867, and had as its object the interchange of views on the establishment of international uniformity in the world's coinage. No treaties were enacted, however, to carry out the decisions. The second conference assembled in Paris in 1878 at the invitation of the President of the United States, but no practical results were obtained. The third met in Paris in 1881, at the joint call of the United States and France. While the project met with heartier support than in 1870, the conference adjourned without reaching definite conclusions. In 1892 the United States called a fourth conference, at Brussels, to consider the enlarged use of silver. The conference adjourned without action.

In July, 1933, the World Economic and Monetary Conference at London failed to achieve any notable purpose. There had been suggestions for currency stabilization, tariff reductions and the lowering of other trade barriers, but none of these were realized. The American delegates were Secretary of State Cordell Hull, Senator Key Pittman and James M. Cox. Professor Raymond C. Moley, then Undersecretary of State, made a belated trip to the conference. An unofficial money stabilization conference was held in London in 1935. It was presided over by Dr. Nicholas Murray Butler.

**Money**, a medium of exchange, which fulfils the functions of a measure of value. Various commodities have satisfied this primary condition in different countries at different times. Salt, rice, cocoa, olive oil, tobacco, tea, dates, and even cattle, with other articles, were thus employed by ancient peoples. With the progress of civilization the place of these miscellaneous commodities has been generally taken by the precious metals. The latter not only possess general acceptability, but they are also portable, durable; and affected by wear and tear, while their value remains comparatively steady. The adoption of coin in place of bullion adds in no small degree to the convenience and efficiency of money. Successive developments of coining—such as stamping one side, and then the other, and then milling the edges, to prevent removal of the metal by clippers or sweaters—have rendered coins at once more easily recognized and more lasting.

*Free coinage* means that the minting authorities place no restriction on the quantity of bullion which they receive. *Gratuitous coinage* implies that the government bears the expense of the transaction and makes no charge for its services. In other countries in the case of standard money, and in the United States in that of token money, a charge is made for coining. A *seigniorage*, as it is called, is deducted, and less metal is put into the coin than the value on its face represents. If the seigniorage amounts to no more than the cost of coining, it is termed *brassage*. By increasing the seigniorage, or debasing the coins, different governments have in times of difficulty, raised what is in effect a forced loan from their subjects, at the risk—never small, and often calamitous—of disturbing business relations. Paper money, the intrinsic value of which is *nil*, though the conventional value may be great, has been aptly described as money on which the seigniorage charge is one hundred per cent. The amount of money in circulation in the U. S., Oct., 1942 was \$14,224,298,194. This is a per capita circulation of \$105.82. For additional information, see COINAGE; BANKING; CURRENCY; MONETARY CONFERENCES; PAPER MONEY; MINTING; BIMETALLISM.

**Money Lending.** See **Loan; Usury; Building and Loan Associations.**

**Money Order.** See **Post Office.**

**Monge, Gaspard** (1746-1818), French mathematician and physicist. He invented that method of applying geometry to construction now known as descriptive geometry. In 1796 Monge went to Italy to superintend the removal of the captured art treasures to France, and there met Bonaparte, whom he accompanied to Egypt (1798), becoming director of the newly founded Egyptian Institute.

**Monghyr**, or **Munghyr**, municipal town, Bengal, India. Cotton cloth, shoes, and furniture are made; p. 47,000.

**Mongolia**, a vast region of Central Asia, nominally belonging to China, but practically independent, is bounded on the n. and n.e. by Siberia, on the e. by Manchuria, on the s. by China proper, and on the w. by Sinkiang, Zungaria, and Russian Turkestan. Physically the country may be likened to a vast shallow basin bordered by mountain ranges, scattered hills, and rolling plains. In the center of this basin, extending into Sinkiang, lies the great Gobi Desert. To the n. are the lofty plateau of Northwest Mongolia,

and the wooded hill country of North Central Mongolia. To the s. and s.e., intersected by the Greater Khingan range, is the rolling country of Inner Mongolia—a transition from the Gobi region to the fertile lands of Manchuria and China.

Few rivers of great size rise in Mongolia except on the northern frontier, whence they flow into Siberia, as the Yenisei and the Selenga, or in the extreme n.e., where some headwaters of the Amur take their rise. Lakes are numerous, the largest being Kossogol, or Kosgol. The *climate* on the whole is healthful, dry, and invigorating. For seven months of the year the cold is extreme, bitter winds sweep over the country from the n., and tempests of great violence occur. The brief summers are periods of abundant sunshine and cooling rains.

The soil is generally poor except in the basins of the lakes and rivers and on the rolling plains of Southern Manchuria, and vegetation is confined almost wholly to mountain forests, pasture lands, and stretches of coarse scrub. The great industry of the native Mongolians is cattle and horse breeding, and the chief wealth of the people consists in herds of horses, cattle, sheep, and camels. Agriculture is carried on to some extent in Inner Mongolia, but almost wholly by the Chinese settlers, who raise indigo, cotton, opium, and rice. Manufactures are limited to rugs, felt, and saddles. The population of Mongolia is roughly estimated at 3,000,000, chiefly Mongols. The universal religion is that of Lamaism, a variety of Buddhism. The chief town is Urga.

In 1911, shortly after the outbreak of the Chinese revolution, the more vigorous of the tribes of Northern Mongolia declared their independence of China. Outer Mongolia became a republic in 1924; a part of Inner Mongolia joined the U. S. S. R.; and in 1929 the Burga district produced an independent republic. Inner Mongolia contains important mineral resources—especially iron in Chahar and coal near Tatung, which the Japanese, since their occupation of the country in 1937, have attempted to exploit. Consult Andrews' *Across Mongolian Plains* (1921), the *China Year Book* published by the Chinese Govt. Bureau of Economic Information.

**Mongols**, an Asiatic people who range over a vast domain between Siberia, China, and Tibet. The typical Mongols are distinguished by their yellowish color, brachycephalic (short) heads, broad flat features, very prom-

inent cheek bones, small nose, small black and oblique eyes, long lank jet-black hair of the horse-tail texture and round in transverse section, robust undersized figures, coarse build, and ungainly appearance, except in the saddle, where most of their time is passed. The *Mongol language*, spoken with considerable uniformity by all branches of the family, is a typical member of the Ural-Altaic linguistic stock, somewhat intermediate between Turki and Manchu. *Mongol literature* consists mostly of translations of Tibetan and Chinese Buddhist writings, with some national chronicles and legendary matter, and scarcely any poetry beyond a few popular songs.

**Mongoose.** See **Mungoose**.

**Monism**, that speculative theory of the universe which attempts to reduce it, with all its apparent diversity, to the unity of a single principle. Spinoza is the most conspicuous representative of the monism which preserves matter and mind in equipoise as aspects of a single substance. The prominence of physical science in modern thought has brought it about that much that calls itself monism throws all the real weight on the material side. Of idealistic monism Hegel, and in a sense Schopenhauer, might be regarded as examples; but this classification and juxtaposition is open to objection.



*Monitor (lizard).*

**Monitor**, a lizard of the genus *Varanus*, which includes nearly 30 species, distributed over S. Asia, Africa, and Australia. The body may reach a length of from 6 to 7 ft., so that the monitors are the largest of the lizards. They feed upon whatever animals they are able to overcome. The habitat is very varied, some species being partially aquatic, while others inhabit forests and still others dry sandy deserts

**Monitor**, a class of armored turret vessels of light draught and low freeboard, that is, with the upper deck very little above the water. The reputation of the monitor type was a result of the action between the original *Monitor* and the *Merrimac* in 1862. In the popular mind the idea became fixed that the *Monitor* administered to her adversary a most crushing defeat. Such was not the case, but, inasmuch as the *Monitor* proved invulnerable to her opponent and succeeded in preventing further depredations upon the Federal fleet, the strategical advantages were quite equal to those which would have resulted from a more decisive action. The plans of the *Monitor* were presented to the Navy Department by the famous engineer John Ericsson, and he superintended her building.

**Monk.** See **Monasticism**, **Monastery**.

**Monk, Maria** (c. 1817-50), Canadian impostor, first came into public notice in 1835. She at that time declared that she had made her escape from the Hôtel Dieu Nunnery in Montreal, and prepared a plausible account of abuses alleged to have taken place in that institution, published as *Awful Disclosures by Maria Monk* (1836) and *Further Disclosures* (1836). She was exposed by Col. William L. Stone. Maria Monk's books had an enormous sale, and are still to be found.

**Monkey**, a name often loosely applied to the members of the order Primates. We use it here to exclude the anthropoid apes, and marmosets. As thus limited, it includes the New World monkeys, the Cebidæ of naturalists, and the Old World monkeys, or Cercopithecidæ. Monkeys are typically arboreal animals, admirably adapted for swinging from bough to bough of the trees among which they live. The American forms, in spite of the assistance rendered by the tail, are much less agile and supple than their Old World representatives, who, by aid of their four 'hands,' perform wonderful feats of gymnastics. The typical diet consists of a mixture of fruit and insects, but there is considerable variation in detail. The intelligence, according to most observers, is notably higher in the Old World forms than in the American types which, generally, are inferior in organization. Most species are social in habit, living in flocks under the leadership of an old male. In the wild state, no less than in confinement, much attention is given to the care of the body and to cleanliness.

**Monmouth, James, Duke of** (1649-85), was born at Rotterdam, an illegitimate son either of Charles II., or one of the Sidneys.

When in 1662 the boy was brought to England, he was lodged in the royal palace, created Duke of Monmouth, and married to the Countess of Buccleuch, April 8, 1663. In American Revolution, fought on June 28, 1778, at Monmouth Court House, Freehold, N. J., between the Americans under Gen. Washington and the British under Gen. Hen-



*Types of Monkeys.*

American Monkeys.—(*Cebidæ*):—1. Red-backed saki. 2. Brown howler. 3. Brown capuchin. 4. Woolly Spider-monkey. Old World Monkeys.—(*Cercopithecidæ*):—5. White-tailed guereza. 6. Snub-nosed monkey. 7. Lion-tailed macaque. 8. Gelada.

1685, he asserted his right to the throne. His rebellion was suppressed at Sedgemoor, and he was executed.

**Monmouth, Battle of**, a battle of the

ry Clinton. The result was tactically a drawn battle, but was strategically a victory for the Americans.

**Monmouth College**, co-educational insti-

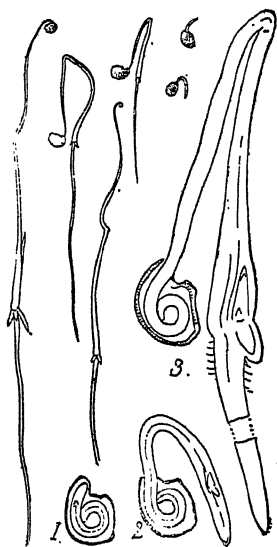
tution under United Presbyterian control, at Monmouth, Illinois, founded in 1856. The college offers seven courses of study, all leading to the bachelor's degree.

**Monmouthshire** (anc. *Gwent*), maritime co. of England, on the Welsh border. The surface is in parts highly picturesque. Coal, iron ore, limestone, sandstone and clay are worked. Metallurgical industries are extensively carried on. Area, 539 sq. m.; p. 342,078.

**Monoceros**, the Unicorn, a constellation to the s. of Gemini. It is in the Milky Way, and contains some interesting nebulae and clusters.

**Monochord**, an ancient Greek instrument consisting of one string stretched across a long, narrow box. By means of a movable bridge the string could be shortened at certain points, and thus could produce different tones.

**Monoclinical Strata** are rocks the beds of which undergo a sudden change in their inclination or dip, and then resume their former disposition. The best known examples of this type is on the flanks of the Uinta Mountains, Utah.



*Seed of a Monocotyledon (Onion) germinating.*

1, 2, 3, Diagrams of successive stages.

**Monocotyledons**, a sub-class of that division of the flowering plants (Phanerogamia) in which the seeds are enclosed in an ovary (Angiospermæ).

**Monody**, in literature, a composition of a melancholy character based upon a single emotional theme. The term was originally used in Greek tragedy of an ode sung by a single actor. In Music, the term monody denotes a form of composition written for but one voice, as opposed to polyphony. See POLYPHONIC.

**Monœcious**, a term introduced by Linnaeus to describe those plants which have the stamens and pistil in different flowers, but upon the same plant—e.g., hop, box, birch, alder.

**Monogenism**, the theory in ethnology which holds that mankind forms a single genus, with a single species—i.e., sprang from one pair or group, in one region, whence it spread by migration over the habitable world.

**Monogram**, a combination of two or more letters, used as a cipher or the abbreviation of a name. Examples are to be found on early Greek coins, medals, and seals, standing for the names of rulers and individuals, or for the names of the towns in which the pieces were struck. Popes, emperors, and kings of France, during the Middle Ages, were in the habit of using a monogram instead of signing their names. Consult F. H. Rees' *Art of Monogram Designing and Engraving* (1911).

**Monograph**, a work in which a particular subject in any science is treated by itself, and forms the whole subject of the work.

**Mono Lake** (alt. 6,730 ft.), situated in Mono co., California, near the borders of California and Nevada. It is about 14 miles long and 9 miles wide, and has a total area of about 85 miles. It has no outlet, and its waters are intensely salty.

**Monolith**, a term denoting any free-standing pillar stone, whether unhewn or shaped and polished or sculptured. See CIRCLES OF STONE; OBELISK.

**Monologue**. See **Dialogue**.

**Monomania**, a form of insanity in which the patient entertains exalted notions of his own importance, and usually has one central systematized delusion which dominates his life and conduct. Its onset is generally preceded by a long stage of depression or hypochondriasis. See **INSANITY**.

**Monometallism**, a financial theory or system of a single metallic standard of value in coinage, as opposed to **BIMETALLISM**.

**Monongahela River**, a head stream of the Ohio, flows generally n. to its junction with the Allegheny at Pittsburgh. Its drainage area is 7,625 sq. miles; total length, 300



miles. It is navigable to Fairmont, W. Va. On July 9, 1755, Gen. Edward Braddock was defeated on its banks, about 10 miles e. of Pittsburgh.

**Monophysites**, a heretical party of the 5th and sixth centuries, so called from their belief that there was in Christ only one nature. Monophysitism is still a considerable force in the Greek Church. See GREEK CHURCH.

**Monoplanè.** See **Aeronautics**.

**Monopolies.** In the original sense of the term, monopoly is the exclusive privilege of selling or producing for sale some commodity or service. In broadened present usage, Ely's definition covers the ground: 'Monopoly means that substantial unity of action on the part of one or more persons engaged in some kind of business which gives exclusive control, more particularly, though not solely, with respect to price.' Monopolies are of four leading types: government monopolies; governmentally granted private monopolies; natural monopolies; and capitalistic monopolies. As examples of the first class may be cited the tobacco monopoly of France, the camphor monopoly of Japan, and the postal service of practically all modern states. Examples of the second class are patents and copyrights, and the exclusive trading privileges formerly granted to such companies as the British East India Company and the Hudson's Bay Company. From 1601 to 1689 the English people, through Parliament, were protesting and legislating before they freed themselves from these oppressive monopolies. It is doubtless the aftermath of this history that in no small part accounts for the great American fear of monopolies in private hands.

Monopolies of the third class depend upon the control of limited natural resources, as the anthracite coal field; upon possession of a superior natural advantage, as in the case of railways which follow the best available route between important centers; or upon the superior efficiency that arises from unitary control, as in the case of gas, electric lighting, telegraph and telephone companies. For discussion of capitalistic monopolies, see **TRUSTS**. In some cases combinations of laborers have managed to secure control of the terms of admission to certain employment, and thus have become virtual monopolies. See **TRADE UNIONS**. Unregulated private monopoly is contrary to the spirit of the common law of the United States and England; it is also generally prohibited by statute. All combinations, therefore, and all contracts having for their

end the establishment of monopoly, are illegal.

**Monotheism**, belief in the unity of the Godhead, or in one God. Though not antagonistic to philosophical dualism, it is opposed to every form of religious dualism. See **POLYTHEISM**; **RELIGION**.

**Monothelism**, the doctrine that Christ had only one will; a modification of Eutychianism (see **EUTYCHES**).

**Monotremata**, the lowest order of mammalia, co-extensive with the subclass Prototheria, and containing only the Ornithorhynchus and the Echidna. See **MAMMALS**.

**Monotype.** See **Typesetting Machines**.

**Monreale**, city, province Palermo, Sicily; 5 miles southwest of Palermo. Its magnificent cathedral, founded in the twelfth century by William II, the Norman duke, is the metropolitan see of Sicily; p. 21,000.

**Monroe, James** (1758-1831), 5th President of the United States, was born April 28, 1758, in Westmoreland co., Va. At the age of eighteen he became a student in William and Mary College, but at the beginning of the Revolutionary War he left his books and joined the enlisted forces of his native State as lieutenant of the Third Virginia Regiment (1776). In 1782 he was elected to the Assembly of Virginia, and appointed one of the executive council. Next year he was returned to Congress, where he sat for three terms (1783-6); and in 1785 he was chairman of a committee whose report ultimately led to the Conventions at Annapolis and Philadelphia, in 1786 and 1787, at which the Constitution of the United States was framed. From 1790 to 1794 Monroe was a member of the United States Senate, and offered determined opposition to Washington and the Federalists. Much to his surprise, he was selected by Washington to succeed Gouverneur Morris as Minister to France. He was recalled in 1796 for displaying too decided French sympathies.

After living for a time in retirement, Monroe became governor of Virginia, holding that office from 1799 to 1802. President Jefferson then sent him as an extra plenipotentiary to France, where in 1803 he and Robert R. Livingston effected the purchase of Louisiana, an event which powerfully influenced the progress of the United States (see **LOUISIANA PURCHASE**). In 1811 he was again chosen governor of Virginia. In the same year President Madison made him his Secretary of State, a post he retained until 1817. During 1814-15 he acted also as Secretary of War,

after the Battle of Bladensburg and the burning of the capitol at Washington; and he at once infused new vigor into the military operations of the Government. Monroe thereby became the logical candidate of the Anti-Federalists for the Presidency; and in 1816 he was elected to that office. The most important events of his first term were the acquisition of Florida from Spain (1819), and the settlement of the vexed question respecting the extension of slavery by the Missouri Compromise. These helped to bring about his re-election in 1820, with but one electoral vote against him. During his second term, his most popular acts were the recognition of the independence of the Spanish American republics, and the promulgation, in a message to Congress (1823), of what has since been called the *Monroe Doctrine*. This utterance embodied the principle, 'in which the rights and interests of the United States are involved, that the American continents . . . are henceforth not to be considered as subjects for future colonization by any European power.' (See *MONROE DOCTRINE*.) (For a further account of Monroe's administration, see *UNITED STATES, History*.)

Monroe's life, after he retired from the Presidency in 1825, was spent chiefly on his estate at Oak Hill, Loudoun county, Va., where he acted as justice of the peace, regent of the University of Virginia, and member of the Virginia constitutional convention. James Monroe was the last of the great Virginians who were called to the Presidential chair in the early days of the republic. He was an upright and consistent statesman, and a faithful servant of his country, though he had not the brilliant talents of some of his great contemporaries. Monroe's *Writings* were compiled and edited in 7 volumes (1898-1903) by S. M. Hamilton. Consult J. Q. Adams' *Lives of James Madison and James Monroe*; D. C. Gilman's *James Monroe* ('American Statesman Series').

**Monroe, Paul** (1869), American educator, was born in North Madison, Ind. Since 1899 he has been professor of the history of education at Teachers College, Columbia University. In 1912-13, as special U. S. commissioner, he investigated the school system of the Philippines. His text books on education are well and favorably known; while his editorship of *The Cyclopædia of Education* (5 vols., 1910-13) has gained him an international reputation. His published works include: *Text Book in the History of Education* (1905); *Brief Course in the History of*

*Education* (1907); *Principles of Secondary Education* (1914).

**Monroe, Will Seymour** (1863-1939), American educator and author, b. in Hunlock, Pa. Professor of psychology in the New Jersey State Normal School at Montclair, 1909 until 1925 when he retired. His works include: *Turkey and the Turks* (1907); *In Viking Land* (1908); *Sicily, the Garden of the Mediterranean* (1909); *Bulgaria and Her People* (1914); *The Spell of Bohemia* (1929).

**Monroe Doctrine**, the fundamental principle of the foreign policy of the United States relative to its attitude toward the interference of non-American powers in American affairs. It was first enunciated by President Monroe in his message to Congress on Dec. 2, 1823. It contains the assertion that American territorial integrity will be preserved against European acquisitions, and that the destinies of the Latin-American republics must not be controlled by European powers. Ever since the promulgation of the Doctrine, in 1823, it has been repeatedly appealed to by the President or by Congress to justify the opposition of the United States Government to some threatened intervention by a European power in the affairs of some Latin-American republic. And the number of cases in which its silent influence prevented intervention has been far greater than those in which a specific appeal has been made to it.

In August, 1912, the U. S. Senate, as far as it had authority, extended the application of the Monroe Doctrine to include Asiatic as well as European powers. This resulted from the supposed effort of Japan, or at least of a Japanese syndicate, to get control of territory on Magdalena Bay in Southern California. The Monroe Doctrine is an attitude of mind, rather than an official statement. It represents a determination upon the part of the United States to use whatever measures may be necessary to secure its peace and safety. Changing conditions bring new dangers to its peace and safety; hence the Monroe Doctrine has been interpreted, and will be interpreted, differently from the meaning of 1823. But it will always be interpreted with that one object in view. Consult A. B. Hart's *Foundations of the American Foreign Policy*; W. H. Taft's *The United States and Peace* (1914); C. H. Sherrill's *Modernizing the Monroe Doctrine* (1916).

**Monrovia**, town, capital of Liberia, West Africa, on the coast, at the mouth of the St. Paul River. It is the seat of a Protestant Episcopal bishop, and of a number of mis-

sions; and has a government and a Methodist Episcopal mission school. There is telegraphic communication with Europe and America by way of Tenerife. The exports are coffee, palm oil and kernels, ivory, ginger, cocoa, and rubber. Monrovia was settled in 1822 by freed American slaves. In the World War it was bombarded by a German submarine; p. 10,000.

**Mons**, city, Belgium, capital of Hainault prov., on the Trouille; 35 miles southwest of Brussels. The Church of Saint Waltrude, founded in 1450, is said to be one of the most beautiful in Belgium. Mons was founded in the eighth century, and in the eleventh became the residence of the counts of Hainault. It underwent several sieges in the long wars of the seventeenth and eighteenth centuries; p. 27,324. Early in the Great War of Europe, in August, 1914, Mons was defended by the British expeditionary army. After a desperate engagement the British were forced to retreat, and the town fell into the hands of the Germans. In the early hours of Nov. 11, 1918, British troops re-entered Mons and there awaited cessation of hostilities.

**Mons and Sambre, Retreat from** (Aug. 23 to Sept. 3, 1914). See **Europe, Great War of**.

**Monseigneur**. See **Monsignor**.

**Monserrat**, or **Montserrat** ('Serrated Mountain'), moun., Barcelona prov., Spain, on the Llobregat River; 4,070 ft. in height. On its slope, connected with Monistrol by a mountain railroad, stands the Benedictine Monastery of Monserrat (2,910 ft. elevation). Founded in 880, from the fifteenth century onward it was one of the wealthiest and most powerful of the Spanish monasteries.

**Monsieur**, the French title of address, applied to all classes, corresponding in general to the English 'Mr.,' but prefixed also to titles of honor and nobility. It is abbreviated 'M.'

**Monsignor**, (Italian, *Monsignore*, 'my lord'; French *Monseigneur*), a title of honor bestowed on high ecclesiastical dignitaries of the Roman Catholic Church; also on high secular potentates and officials. It is abbreviated 'Mgr.'

**Monsoons** (Arabic *Mausim*, 'a set time,' 'season'), are winds that change regularly with the seasons. The term was for long applied to those winds prevailing in the Indian Ocean which blow from the southwest from April to October, and from the opposite direction, or northeast, from October to April. It is now generally applied to the winds con-

ducted with all continents which are of regular occurrence with the periodical return of the seasons. See **WINDS**. Consult Coffin's *Winds of the Globe*; Moore's *Descriptive Meteorology* (1910).

**Monsters**, animals or plants showing congenital malformation, usually arising from excess, deficiency, or imperfection of certain organs. Organized knowledge of the subject is the science of teratology. Human monsters are believed to arise from arrested development at the time of the differentiation of organs (the embryonic period). Among assigned causes are pressure, the action of germs, and the presence of chemical agents.

**Monstrance**, the sacred utensil employed in the Roman Catholic Church for presenting the consecrated wafer for the adoration of the people.

**Montagnards**, advanced republican and war party in the French Revolution, nicknamed from the highest seats in the Convention, where they sat (1793) as opponents of the Girondists (moderates), who occupied the floor of the house. Under the leadership of Marat, Danton, Robespierre, and St. Just, they overthrew the Girondists (May 31-June 2), and crushed all internal opposition by the Reign of Terror. See **FRENCH REVOLUTION**.

**Montagu, Lady Mary Wortley** (1689-1762), English author, eldest daughter of the Duke of Kingston. The letters describing her travels form perhaps the best-known portion of her correspondence, and their novelty, liveliness, and wit gave them an immediate reputation. Among the best of her productions are the admirable letters to her daughter, the Countess of Bute. Her literary criticisms have a value apart from their contemporary interest. She had a wide acquaintance among men and women of note, including the poet Young, Horace Walpole, Dr. Johnson, Burke, Garrick, Sir Joshua Reynolds, and Fanny Burney.

**Montaigne, Michel Eyquem, Seigneur de** (1533-92), French essayist, was born at the Château de Montaigne, near Bordeaux. He commenced (1571) the composition of *Essais*. In 1588, when issuing the fifth edition of his *Essais*, he added to it the third book, containing some of his finest work. Of the individual essays those on 'Constancy,' on 'Philosophizing Being to Learn How to Die,' on 'Friendship,' on 'Moderation,' on 'Glory,' on 'Presumption,' on 'Governing One's Will,' and on 'Experience' are generally regarded as the finest. Montaigne was an ethical an-

alyst of the first order, and he did not scruple to apply drastic remedies to patent moral evils. His ideas, opposed to the extreme classicism of his time, influenced Locke and Rousseau. The standard French edition of his work is that by Moutheau and Jousaust; the best English editions are those by Saintsbury, Hazlitt, and Jacob Zeitlin (1934). A new edition containing Emerson's Essay (Emerson Edition) was published in 10 volumes in 1911. Consult Dowden's *Montaigne* (1905); Woodberry's *Great Writers* (new ed., 1912).

**Montalembert, Charles Forbes de Tryon, Comte de** (1810-70), French historian and publicist, was born in London in 1810. He early won a name as an orator. After 1857 he exerted from time to time a great political influence by books and pamphlets. Perhaps he never rose higher than at the Congress of Malines in 1863, when he delivered a masterly speech in favor of toleration. His most considerable literary work was *Les Moines d'Occident* (5 vols., 1860-7; Eng. trans. *Monks of the West*). In 1862 he wrote a remarkable little book about his friend, *Le Père Lacordaire*.

**Montana** (popularly known as 'the Treasure State'), is one of the Western States of the United States. It is bounded on the n. by the Canadian provinces of Saskatchewan, Alberta, and British Columbia; on the e. by North Dakota and South Dakota; on the s. by Wyoming and Idaho; and on the w. by Idaho. It has extreme dimensions from n. to s. of 315 miles, and from e. to w. of 580 miles. It ranks third among the States in size, having a total area of 146,572 sq. miles, of which 796 are water. Montana is divided naturally into two sections possessing distinct physical characteristics—i.e., the region of the plains, comprising the eastern two-thirds of the State, and the region of the mountains, covering the remaining western portion. The Bitter Root Mountains, with an elevation of from 7,000 to 8,000 ft., mark the State's southwestern boundary. The main chain of the Rocky Mountains, with peaks reaching an elevation of from 8,000 to 11,300 ft., extend from the Yellowstone Park obliquely across Montana in a northwesterly direction. Between these two mountain ranges is a great basin which embraces about one-fifth of the entire area of the State. About three-fifths of the area lies e. of the Rockies, and consists of rolling tablelands. That portion of Montana lying e. of the Main Divide of the Rocky Mountains, comprising the

greater part of its area, is drained by the Missouri River, which is formed by the junction of the Jefferson, Madison, and Gallatin Forks. In the main, the rivers rise high up in the mountains and fall rapidly, affording great water power, which is utilized on a large scale at certain localities. There are many mineral and thermal springs. The Glacier National Park was established by Act of Congress in May, 1910. It embraces about 14,000 sq. miles of unrivalled mountain scenery, including Lake McDonald and over 60 glaciers in all stages.

The climate of Montana is healthful and bracing. The mean temperature at Havre is 9° F. for January and 67° for July, with extremes of -55° and 108°. The mean annual precipitation at Fort Custer is 13 inches, which may be taken as an average for the whole eastern section. To the w. of the Main Divide the rainfall is more abundant. The dryness of the air modifies the effects of the temperatures of both winter and summer. The soil within the valleys proper is a rich black loam, well suited to the production of grasses and cereals. The soil of the eastern plains or bench lands is generally a light sandy loam. In the foothills and the valleys of the western basin the soil most suited to agriculture is found. The structure of the mountain region is complex and varied. Most of the ridges, however, belong to the Eozoic and Silurian formations. Montana ranks sixteenth among the States in the value of its mineral products. The leading mineral activities in Montana in the order of their importance are the production of copper, zinc, coal and petroleum. Copper was discovered in 1880 at Butte where the Anaconda mine commenced delivering products destined to make it the greatest of mining camps, and the Anaconda Copper Mining Company the largest copper producing organization in the world. Every year reports fresh discoveries of oil in the State. Natural gas promises to be a valuable product and to supply even the larger cities with cheap fuel. Montana ranks first among the States in the reserves of high grade manganese ore and in output. Mines located in Judith Basin County are the greatest regular producers of highest quality sapphires in the world. The mines at Butte have produced more silver than any other district on earth.

About 20,000,000 acres of the area of Montana is forest-covered. Douglas fir, western yellow pine, lodgepole pine, Englemann spruce, western larch, cedar and white pine

are the chief forest trees. There are seventeen national forests within the State, embracing a net area of 15,882,000 acres. Lumbering is one of the chief industries of the State. Owing to insufficient rainfall in all but certain portions of the western slope, irrigation is being more and more resorted to. The principal crops are hay and forage, wheat, potatoes, and oats. Fruits, including apples, pears, peaches, and cherries, are grown in increasing quantities. For a number of years Montana had by far the greatest number of sheep credited to any State, and was the greatest producer of wool. It also raises cattle, horses, swine and mules. Although Montana is not relatively important as a manufacturing community, the manufactures of the State have shown, on the whole, considerable increase. Important for the development of manufactures are the coal, gas and oil fields and the waterfalls, especially those of the Missouri River in the vicinity of Great Falls. The fall of the river in a distance of ten miles amounts to more than 500 ft. Here was built the State's first water power plant in 1891. The potential water power of Montana is estimated at 2,550,000 horsepower. Leading industries are: flour-mill and grist-mill products; lumber and timber products; cars, shop construction, and repairs by railroads; petroleum refining; slaughtering and meat packing; butter; beet sugar; printing and publishing newspapers and periodicals; bread and other bakery products; foundry and machine shop products; canning and preserving. Butte and Great Falls are important centers, their pre-eminence being mainly due to the refining and smelting of copper and lead.

The population of Montana in 1940 was 559,456, an increase of 21,850 or 4.1 per cent. since 1930. Urban population was 37.8 per cent. of the total. The population of the principal cities in 1940 was: Butte, 37,081; Great Falls, 29,928; Billings, 23,261; Missoula, 18,449; Anaconda, 11,004; and Helena, 15,056. The State maintains the University of Montana at Missoula, and the State College of Agriculture and Mechanic Arts at Bozeman, with which are affiliated an Experiment Station and a State School of Mines at Butte. The U. S. Government maintains an industrial boarding school for Indians at Fort Belknap. The present constitution was adopted in 1889, preliminary to the admission of Montana as a State. Amendments require the approval of a two-thirds vote of all members of both houses of the legislature and of a majority of the voters at a popular election.

Residence in the State for one year is a prerequisite to voting.

Legislative authority is vested in a Senate elected for a term of four years, one-half being chosen biennially, and in a House of Representatives elected for two years. Executive authority is vested in a Governor, Lieutenant-Governor, Secretary of State, Attorney-General, Treasurer, Auditor, Adjutant-General, and Superintendent of Public Instruction, elected for a four-year term. Judicial power is vested in a Supreme Court, consisting of a chief justice and four associate justices, elected for terms of six years. Under the Reapportionment Act Montana has two Representatives in the National Congress. Helena is the State capital.

*History.*—The present State of Montana was originally embraced, in part, by the Louisiana grant. It was first explored in 1742-43 by *Sieur de la Verendrye*. No further explorations are recorded until 1805, when the Lewis and Clark Expedition to the Pacific Coast crossed the region, dividing into two parties and following the courses of the Missouri and Yellowstone Rivers to their junction. The discovery of gold near Hell Gate River, in 1852, was the real beginning of the country's development. Following the discovery of gold at Fairweather Gulch, Virginia City was founded, and within a year the population increased to 4,000. The Montana region was organized in 1860-61 as Shoshone and Missoula counties of Washington Territory. In 1863 Idaho and Montana were set off from Washington under the name of Idaho Territory; and on May 26, 1864, Montana was established as a separate Territory, with its capital at Virginia City. In 1874 the territorial capital was removed from Virginia City to Helena.

Conflicts with the Indians were frequent in the early history of the State, and on June 25, 1876, occurred the disastrous battle of General Custer with the Sioux Indians on the Little Big Horn River. The mining of copper and silver became a leading industry about 1880, and was soon more extensively engaged in than gold mining; but more recent years have brought a decline in silver production and an increase in gold production. The Northern Pacific Railway, surveyed as early as 1853, partly through the stimulus of mining activity and partly through the increase of Pacific trade, was pushed to completion in 1883. In 1884 a constitution was framed and adopted. Application was made for admission to the Union; but the enabling act was not

passed until 1889, and Montana became a State on Nov. 8 of that year. In 1910 the Flathead Indian Reservation was thrown open for settlement. In 1916 Montana had the distinction of sending to the United States Congress the first woman ever seated in that body, when Miss Jeannette Rankin was elected one of the State's two representatives. The great Fort Peck Dam, Federal power and flood control project, is located on the Missouri River in Montana.

**Montana State College**, a non-sectarian, co-educational institution at Bozeman, Mont., opened in 1893. The Montana Agricultural Experiment Station (380 acres) is affiliated with the university. See under UNIVERSITY.

**Montana, State University of**, a State institution of learning for both sexes at Missoula, Mont., founded in 1895. See under UNIVERSITY.

**Montauban**, town, France, department of Tarn-et-Garonne, overlooking the Tarn River. It has a Renaissance cathedral, completed in 1739. The town is the seat of a bishop. It trades in wines and grain, manufactures silks and woollens, and in the seventeenth century was renowned for its pottery. The inhabitants warmly embraced the Huguenot faith, and endured four sieges in 1562, and another, lasting for three months, in 1621. After the revocation of the Edict of Nantes, Louis XIV. demolished its fortifications; p. 30,000.

**Montauk**, an Algonquin tribe of American Indians formerly inhabiting the eastern end of Long Island, New York. They were devastated by war and disease in the seventeenth century, and by 1870 had practically disappeared.

**Montauk Point**, New York, the bold promontory at the eastern extremity of Long Island. It has a stone lighthouse, with a light 168 ft. above sea level, visible 19 miles, and a U. S. life saving station.

**Mont Blanc**. See **Blanc, Mont.**

**Montcalm, Louis Joseph, Marquis de** (1712-59), French soldier, was born near Nîmes. In 1756 he was appointed to the military command of Canada, when the French and Indian War was raging. For some time he was successful against the British and Americans, capturing Fort William Henry in 1757, and beating back General Abercrombie's army at Ticonderoga in 1758. In the latter year, however, the French lost Louisburg and Forts Frontenac and Du Quesne. On the Plains of Abraham, at Quebec, Montcalm fell mortally wounded, in battle against General Wolfe, who also was killed (Sept. 13, 1759).

**Mont Cenis**. See **Cenis, Mont.**

**Montclair**, town, New Jersey, Essex co., 15 miles from New York City; p. 39,807.

**Monte Carlo**, town, 5 m. n.e. of Nice, 1½ miles from Monaco. It occupies a picturesque site overlooking a bay of the Mediterranean, being one of the most beautiful places on the Riviera. The casino, containing the famous gaming rooms, is a showy structure, decorated with statues and paintings. The chief games played are roulette and trente et quarante, with stakes of from 5 to 6,000 and 20 to 12,000 francs; p. 11,055.

**Monte Cassino**, a hill overlooking Cassino, Italy, famous site of a monastery founded by St. Benedict in 529, which became model for monasteries of western Europe. Captured by the Germans in W. W. II, the Allies bombed it.

**Monte Cristo**, a small rocky island, reaching 2,110 ft. in altitude, lies about 40 miles off the w. coast of Italy and 28 miles s. of Elba. It has been the private hunting ground of the King of Italy since 1900. It is the Monte Cristo of Dumas' famous tale, *The Count of Monte Cristo*.

**Montenegro**, a former independent Slav kingdom in the western part of the Balkan Peninsula, included, after the signing of the Armistice that ended the World War (1918), in the newly created Yugo-Slav state (see YUGOSLAVIA). It was bounded on the n. by Herzegovina, on the e. by Serbia, on the s. by Albania, and on the w. by Dalmatia and the Adriatic. It was about three times as large as Rhode Island, with an area of 5,603 sq. miles, 2,129 of which were added after the Balkan War. Montenegro has become the Yugo-Slavian banat of Zeta, with an area of 11,869 sq. miles. Montenegro occupies part of the great Karst limestone plateau, extending from Southern Austria along the Eastern Adriatic to Turkey and Greece. The country is roughly mountainous, with peaks ranging from 2,500 to 8,000 ft., the highest being in the northeastern section. There are two rivers of importance, the Zeta and its tributary Moracha, which empty their combined waters into Lake Scutari. The climate is continental in character, severe and variable. The vegetation is sparse but varied, owing to the diversity of climate. A primitive type of agriculture is carried on along the river valleys, about Lake Scutari, and on the coast. The principal crops are maize, oats, potatoes, barley, tobacco, and buckwheat. Grapes, olives, and figs are also cultivated. Live stock of all kinds are raised in the mountain pastures.

A few good carriage roads connect the principal towns, but for the most part travel is along bridle paths. In 1934 the population of the banat of Zeta was 910,350. The principal towns are Cetinje, capital (p. 5,000) and Podgoritsa. The people are mostly of Serbian stock, the rest being Albanians. They are a brave, warlike, and simple folk. The majority of the people are of the Greek Orthodox faith. The remainder are mostly Mohammedans and Roman Catholics. Education is compulsory and free. Before the Great War and under the Constitution of December 19, 1905, Montenegro was a hereditary constitutional monarchy, with popu-

ceived also certain territorial concessions along the seacoast. In 1905 Prince Nicholas called a national assembly and granted a liberal constitution.

Montenegro joined with Bulgaria, Serbia, and Greece in the Balkan Alliance in February, 1912. On Oct. 8, 1912, she declared war on Turkey and was joined by other members of the Alliance in the First Balkan War. She allied herself with Serbia, Greece, and Roumania in the Second Balkan War and received from Serbia as a reward for her assistance half of the Sanjak of Novibazar, nearly doubling her territory. Upon the outbreak of the World War in August, 1914,



*Photo from Publishers Photo Service.*

*Monte Carlo.*

lar representation. It is now under Yugoslavian government.

About 650 A.D. some Slavic-Serbs, the ancestors of the present Montenegrins, were invited by the Emperor Heraclius to settle the country as a bulwark against the Arabs. In the Middle Ages it formed part of the great Serbian kingdom which was broken by the Turks at the battle of Kosovo (1389). Montenegro, however, retained a semi-independence, with a reigning prince of pure royal Serbian blood. Petrovitch of Njegusky in 1697 freed Montenegro from Turkish sovereignty and was proclaimed Vladika, or Prince-Bishop, and his successors retained the spiritual sovereignty until the death of Peter Petrovitch II., October 31, 1851. By the treaty of Berlin (1878), Montenegro was recognized as an independent power and re-

Montenegro upheld her old ally Serbia, declaring war on Austria, Aug. 7, 1914, and on Germany Aug. 12, 1914. The country was invaded, late in 1915, by the Germans and Austrians, who were driving the remnants of the Serbian Army across the mountains into Albanian territory. The movement for reunion with Serbia crystallized after the Armistice, in 1918, in the deposition of King Nicholas by a National Assembly at Podgoritsa on November 29. Despite the protests of Nicholas to the Powers in conference in Paris the following year Montenegro was incorporated in the new Triune Kingdom of the Serbs, Croats and Slovenes. The king died in 1921 and the Council of Ambassadors recognized the disappearance of Montenegro as an independent sovereignty July 13, 1922. The Kingdom of the Serbs, Croats and Slov-

enes has become known officially as Yugoslavia since Oct. 3, 1929. Montenegro came under Italian 'protection' in 1941.

**Monterey**, city, Monterey co., California, is situated on Monterey Bay. Its fine climate and good beach make it a popular winter resort. Many of the buildings are of adobe. Monterey was founded in 1770 with the establishment of the Spanish mission of San Carlos de Monterey. It was the capital of the Spanish province from 1840 to 1845 and the seat of the military government after

days of stubborn fighting, terms of capitulation were agreed on.

**Montesquieu, Charles de Secondat, Baron de la Brède et de Montesquieu** (1689-1755), French philosophical writer. He became councilor of the Parliament of Bordeaux (1714), and two years later (1716), its president. His first published work, the *Lettres Persanes*, appeared in 1721, a daring and subtle satire on the follies of the day. He devoted himself for some years to travel, and in 1734 published his second great work,



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*A Leading Business Street in Montevideo.*

American occupation in 1846. Robert Louis Stevenson made his home here in 1878; p. 10,084.

**Monterrey**, capital and chief city of the state of Nuevo Leon, Mexico; a well-built modern city, a great railroad center, and has manufacturing interests, including smelters, breweries, flour and cotton mills, ice and cement works. It was founded by the Spaniards in 1560 as Santa Lucia; taken by Zachary Taylor in the Mexican War, 1846; p. 88,458.

**Monterrey, Battle of**, one of the battles of the Mexican War. On Sept. 21, 1846, Gen. Zachary Taylor attacked the city. After two

*Grandeur et Décadence des Romains*; and ultimately, in 1748, his most famous book, *L'Esprit des Lois*, a profound study of the legal and political institutions of the world.

**Montessori, Maria** (1870), Italian educator, was born in Rome. She was graduated from the University of Rome in 1894, being the first woman to receive a degree in medicine from that institution. Her studies led her to introduce a new educational system for young children, since known by her name. In 1907 her first 'House of Childhood' was opened; a second House was established in April, and others followed in Italy and elsewhere. Dr. Montessori visited the United



States in 1913. For an account of the Montessori Method see **KINDERGARTEN**.

**Monteverde, Claudio** (1568-1643), Italian musical composer and inventor of the 'free style' of composition, was born at Cremona. He was the first to employ unprepared dissonances, which led the way to the greatest achievements of modern music.

**Montevideo**, capital and largest city of the republic of Uruguay, is situated on the n. shore of the estuary of the La Plata river. It is built on a peninsula jutting out from the mainland to the w. and inclosing the bay which forms the harbor. Wool, hides, meats, animal fats, and livestock are the principal exports. The total value of foreign trade is about \$67,000,000 annually. Montevideo is the chief railroad center of the country, and has communication by steamer with the United States and Europe. The first settlement of the town was made in 1726; a century later (1828) it became the capital of the newly formed republic of Banda Oriental; p. 683,000.

**Montezuma I.** (c. 1390-1469), an Aztec ruler who followed Itzcoatl as king of Mexico in 1440. At his death the Aztecs were masters of a broad tract of land extending from the Pacific southeast to the Gulf of Mexico, and the empire was in a prosperous condition.

**Montezuma II.** (c. 1479-1520), surnamed Xocoyotzin, war chief of the Aztec confederacy at the time of the landing of Cortes in Mexico. He greatly extended the limits of Aztec domination and subjugated many new provinces; but he permitted Cortes to reach the capital city, Tenochtitlan or Mexico, without opposition, receiving him with honors and gifts (November, 1519), only to be seized by the Spaniards, and held as hostage. One story is that in the ensuing attack on their quarters he was killed at the hands of his own people while pleading with them to desist; another that he was slain by the Spaniards.

**Montferrat, Duchy of**, formerly an independent duchy of Italy, between Piedmont, Milan, and Genoa. The house provided many crusaders, being celebrated as the defender of Tyre against Saladin.

**Montfort, Simon de, Earl of Leicester** (1120-65), one of the prominent figures in the development of the English constitution, was of French birth, but inherited his English title from his grandmother. In 1229 he went to England, and was confirmed in his title and estates. He married the sister of Henry

III. in 1238. In 1258 the discontent then rife in the country came to a head, and the barons appeared in arms at the Parliament at Westminster. The result was the Provisions of Oxford, which admitted the barons to a share in the administration. In 1261 the king repudiated the Provisions of Oxford, and eventually Simon de Montfort, at the head of the forces of the barons, defeated the king's army at Lewes (1264). After the battle a new agreement was drawn up, and in the Parliament which was to assist the king's council we find the prototype of the modern English Parliament, with representation for all classes. Simon de Montfort was unable to maintain his hold over the barons. In 1265 the young prince Edward defeated Montfort at Evesham, Montfort being killed.

**Montgomery, Sir Bernard Law** (1887- ), British general, was born in Ulster, Ireland. He served in World War I, and afterward became staff officer. In World War II he was made a major general and took the Third Division to France. In 1942 he was made head of the British 8th Army in Africa, and led it to victory from Alexandria across 1,400 miles of Africa and into Italy. In 1943 he was made commander of the British forces to attack in Europe, under Gen. Eisenhower. He was later made field marshal and as such accepted the surrender of all German forces in Holland, Denmark and northern Germany, May 1945. He represented Great Britain on the Allied Control Commission.

**Montgomery**, city, capital of Alabama and county seat of Montgomery co. It is an important jobbing and commercial center, handling a large shipping trade in cotton, timber, coal, iron, fruit, vegetables, horses, mules, hogs, and cattle. The surrounding country is known as the 'Black Belt,' which is very fertile. It was founded in 1817. In 1846 it became the State capital, and in early 1861 the capital of the Confederacy; p. 78,084.

**Month**, the interval of time between one new moon and the next. Its mean length of 29.53059 days varies, owing to the eccentricity of the lunar and terrestrial orbits, to the extent of thirteen hours.

**Monticello**, estate of Thomas Jefferson, situated in Albemarle co., Virginia, 2½ miles southeast of Charlottesville. The house stands on a hill and commands a fine view. It was built in 1770, is an interesting example of the architecture of the period, and was one of the finest residences of that time in the South. Jefferson was buried on the estate.

**Montluc, Blaise de Lasseran, Seigneur**

**de** (1503-77), marshal of France. His most famous exploits were the victory of Cérise-les, and the defence of Siena (1555) against the imperial troops. He fought vigorously against the Huguenots in Guienne, and was made marshal in 1573.

**Montluçon**, town, France, in the department of Allier, on the Cher. There are several interesting churches, notably St. Pierre's, of the 12th, and Notre-Dame of the 15th and 16th centuries. The 15th century castle is now used as barracks; p. 36, 114.

**Montmagny, Charles Jacques Hunault de** (?-1651), was appointed to succeed Champlain as governor-general of New France, arriving in the colony in 1636. His administration was a continual struggle to maintain the feeble French settlements against the power of the Iroquois, during which the Huron and Algonquin allies of France were almost annihilated. Montmagny, however, succeeded in 1646 in making a treaty at Three Rivers, which insured some measure of peace to the country for almost twenty years. His term of office ended in 1648.

**Montmartre**, height (320 ft.) and quarter within the fortifications of Northern Paris. Literary men and artists frequent its taverns.

**Montmorency**, river, Quebec, a tributary of the St. Lawrence. At its mouth are the Montmorency Falls, 265 ft. high, which supply electric power to Quebec, 8 miles to the southwest.

**Montmorency, Anne, Duc de** (1493-1567), marshal of France, the friend and military companion of Francis I. He helped to negotiate the treaty of Madrid, and became grand master of the royal household and governor of Languedoc (1526). In 1562, while in the command of the royal army against the Huguenots, he was defeated and captured at Dreux.

**Montmorency, Henri Duc de** (1595-1632), grandson of Anne Montmorency, Constable of France, won distinction in the religious wars against the Huguenots. He was made marshal in 1630, but incurred the enmity of Richelieu, was involved in a rebellion and finally beheaded.

**Montoro**, city, province of Cordova, Southern Spain, on the Guadalquivir, here crossed by a famous old bridge (16th century). There are medicinal springs (July to September), and numerous Roman, Gothic, and Moorish remains. The city is a center of olive oil production; p. 15,000.

**Mont Pelée.** See **Pelée, Mont.**

**Montpelier**, city, Vermont, capital of the

State, and county seat of Washington co., is situated on the Winooski River. It has a magnificent capitol of granite crowned with a dome 124 ft. high and with a statue of Ethan Allen in the portico. Among the educational institutions is Montpelier Seminary. The chief industry is the quarrying and cutting of granite, of which there are extensive deposits in the vicinity. Montpelier was settled in 1787, was organized as a town in 1805, and became the State capital in the same year; p. 8,006.

**Montpellier**, city, France, capital of the department of Hérault, 6 miles from the Gulf of Lions. The city is noted for the pleasant mildness of its climate and the beauty of the surrounding country. It is irregularly built along a slope, and has, for the most part, steep and narrow streets. On the summit of the slope are the Place de Peyron, with a triumphal arch, and the Château d'Eau, the distributing station for the water from the aqueduct. Montpellier possesses the oldest botanic garden in Europe, and one of its most famous universities, constituted in 1289 from the previously existing schools of medicine, law, and arts. Moorish physicians founded the school of medicine and science, with which are associated the names of De Villeneuve, Rabelais, Rondelet the anatomist, Bauhin, Magnol, Tournefort, and De Jussieu. Petrarch was a student here. During the Middle Ages, Montpellier was successively under the rule of Aragon, Majorca, and Navarre. Later it became a Huguenot stronghold. It was generally the place of assembly of the Estates of the province of Languedoc; p. 80, 230.

**Montreal**, largest and most important commercial city of Canada, is situated in Hochelaga co., in the prov. of Quebec, on the southeast side of the Island of Montreal, in the St. Lawrence River, just below its junction with the Ottawa River, at the commencement of Canadian inland navigation, and at the head of ocean navigation. It is distant about 625 miles from the Atlantic Ocean by the course of the St. Lawrence River. Montreal is the leading Canadian railroad center, being the headquarters of the Canadian Pacific, the Grand Trunk, and the Canadian Government Railway System. The fine Victoria Jubilee Bridge, nearly two miles long, with double tracks and steel open girders, spans the St. Lawrence here. Another fine bridge built by the Canadian Pacific Railway, crosses the river at the head of the Lachine Rapids. The harbor, commodious and

deep enough for the largest ships, has seven miles and a half of wharfage accommodation, its docks and wharves being solidly built of stone, and the revetment wall of granite

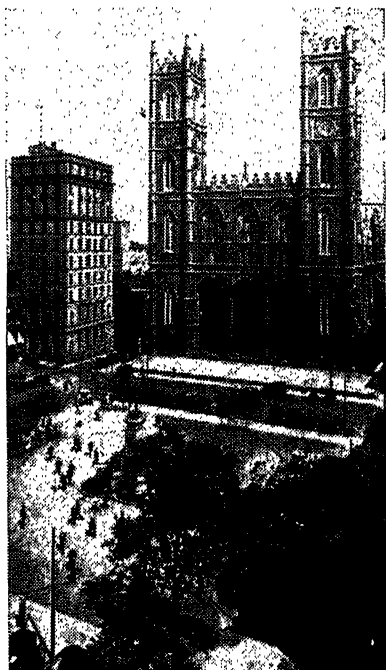


*Montmorency Falls.*

masonry extending along the river front and protecting the city from inundation. The Lachine Canal, built to overcome the difficulties of the Lachine Rapids, is the first of a series of canals which now permit of continuous navigation of Canadian inland waters to the head of Lake Superior. Steamship lines furnish communication with European and other American coast cities.

The city, which extends along the n. bank of the St. Lawrence, for about 9 miles, is built partly on a level plain about 2 miles wide, and partly on the natural terraces which culminate in Mount Royal, a mountain 900 ft. above sea level. The business portion occupies the plain, and the best residential portion is on the slope, and to the n. of the mountain. The older buildings, public and private, are largely of gray limestone quarried in the vicinity. Of recent years the

general aspect of the city has greatly changed through the construction of numerous lofty buildings of the American type, while in the newer residential quarter, brick has almost entirely taken the place of stone in domestic buildings. There are many noteworthy and imposing edifices, including the parish church of Notre Dame (Roman Catholic), one of the largest on the continent, with a seating capacity of 10,000, and possessing the largest bell in America; St James Cathedral (Roman Catholic), modelled after St. Peter's at Rome, and one-fourth its size; Christ Church Cathedral (Anglican), built in the decorated Gothic style, with a tower 224 ft. in height; Church of Notre Dame de Lourdes; the Jesuit Church, noted for its fresco work and paintings; and several fine Protestant churches; and Château de Ramezay, the former residence of colonial governors and of the American Commissioners Franklin, Chase, and Carroll, when they came to negotiate for the co-operation of Canada in the Revolutionary War.



*Notre Dame Church, Montreal, Canada.*

The summit of Mount Royal is laid out as a park of 460 acres, and is the most noteworthy of the city parks. It is 900 ft. above sea level and 740 ft. above the river. Chief

among the educational institutions is McGill University, founded in 1821. Of the educational institutions of the French-speaking population the most important is Laval University. The Seminary of St. Sulpice, founded in 1684, is the theological school of Laval University. The schools of Protestants and Catholics are separate, and the school system is managed by two boards of commissioners, Protestants and Roman Catholics.

Montreal is a leading industrial city with a large variety of manufacturing establishments. In the matter of bank clearings, Montreal holds an important place among the cities of the American continent. During the season of navigation, from May to November, Montreal is the great maritime port of the Dominion, a dozen trans-Atlantic steamship companies making it one of their headquarters; while a lake and river and coast navigation of great activity increases and diversifies the business of the city. Its canals afford a continuous course of water communication extending from the Straits of Belle Isle to Port Arthur at the head of Lake Superior, a distance of 2,260 miles, and enables it to touch and handle the trade of Duluth and Fort William on Lake Superior, of Chicago and Milwaukee on Lake Michigan, Collingwood and Goderich on Lake Huron, Buffalo and Cleveland on Lake Erie, Hamilton, Toronto, Kingston, and Oswego on Lake Ontario. The population of greater Montreal in 1940 was 820,000. People of French descent outnumber all other nationalities; of the rest the Irish are more numerous than those of English and Scotch ancestry. Roman Catholicism is the predominant religion.

*History.*—Montreal ranks with Quebec in the stirring and romantic character of its early history. Its site was visited in 1535 by Jacques Cartier. In 1611 Champlain decided to establish a trading station on the island, and built Place Royale on the site of the present custom house. In 1642 Maisonneuve founded the city. Fur traders had already discovered the commercial value of the site. In 1660 the heroism of Adam Daulac, with a few other young Frenchmen, withstood a force of Iroquois at Long Sault Rapids, and saved the city. The terrible massacre at Lachine, in which 400 persons perished, was the culmination of the Indian troubles that afflicted the settlers. The struggle between the French and the English for the control of the American continent was decided in favor of the latter by the capture of Quebec in 1759, and in 1760 Montreal capitulated. The city

was for a short time the Canadian capital, but the riot of 1847 resulted in the destruction by fire of the parliamentary buildings, and the seat of government was removed to Quebec, and later to Ottawa.

**Montreuil**, town, department of Seine, France, is an eastern suburb of Paris. There is a beautiful 13th century church. It is celebrated for its culture of peaches; p. 58,521.

**Montreux**, a group of villages—Clarens, Vernex, Territet, Veytaux, and others—stretching along the northeast shore of Lake Geneva, in canton Vaud, Switzerland. The region is noted for its beautiful scenery and mild climate, and is well-known as a winter resort. The castle of Chillon is situated nearby; p. 18,407.

**Montrose**, city, Colorado, county seat of Montrose co., on the Uncompahgre River, an important shipping point for cattle; p. 4,764.

**Montrose**, seaport, Forfarshire, Scotland, on the e. coast, at the mouth of the South Esk. It has a good harbor, and is a center of the fishing industry. Flax spinning and timber trade are the principal industries. Montrose was the birthplace of Robert Brown, botanist; Joseph Hume; Sir Alexander Burnes; and Paul Chalmers, R.S.A.; p. 10,196.

**Montrose, James Graham**, Fifth Earl and First Marquis of (1612-50), Scotch Royalist general, known as the 'Great Marquis,' succeeded his father as fifth earl in 1626. In the autumn of 1637 he joined the national movement, and on the renewal of the National Covenant in 1638 became one of its prominent champions. In 1640 Montrose led the Scottish army that won the victory of Newburn, near Newcastle. But he was in 1641 sent a prisoner to Edinburgh Castle. On the king's arrival later in the same year he was set at liberty and thenceforth he gave himself heart and soul to the royal cause. He won signal victories against the Covenanters, but was ultimately driven out in 1646, escaping abroad. On behalf of Charles II., he undertook a fresh invasion of Scotland, but on April 27, 1650 he was defeated. He was hanged on May 21, 1650.

**Montserrat**, one of the Leeward Islands, British West Indies. It is of volcanic origin, the highest summit being Soufrière (3,000 ft.). The island was colonized by the British in 1632; but was French in 1664-8 and 1782-4; p. 12,000. Its capital is Plymouth (p. 1,500).

**Mont St. Michel**, granite islet in Mont St.

Michel Bay, off the coast of France. It is a solitary cone of granite, 2 miles in circumference at the base, and 242 ft. high, crowned by a Benedictine monastery of the eleventh to thirteenth centuries, and surrounded by ramparts with towers. The bay is about 15 miles wide and 8 miles from n. to s. The islet is connected with the mainland by a granite causeway, one mile long; p. 250.

**Montt, Jorge** (1846-1922), Chilean naval officer and politician. On Jan. 7, 1891, he was placed at the head of a provisional government, which defeated President Balmaceda. He was elected President in the fall of 1891, and served the full term of five years. Numerous reforms were instituted during his administration.

**Montt, Manuel** (1809-80), Chilean statesman, was successively President of the House of Deputies, Minister of Foreign Affairs, Minister of Justice and Education, Minister of Interior, President of the Republic for two terms (1851-61), and President of the Supreme Court.

**Montt, Pedro** (1846-1910), Chilean statesman, son of Manuel Montt, became president of the Chamber of Deputies; Minister of Justice, Public Instruction, the Treasury, and the Interior; minister to the United States, and President of Chile (1906). He travelled widely, gaining ideas about labor conditions, railway systems, education, and irrigation, which, so far as was practicable, he endeavored to apply in Chile. He did much to put Chile on a sound financial basis, and favored the peaceful settlement of disputes with foreign countries.

**Moody, Dwight Lyman** (1837-99), American evangelist, was born at Northfield, Mass. At seventeen he took a position in a Boston shoe store. He removed to Chicago in 1856, engaging actively in Sunday school missionary work there. In 1858 he abandoned business to devote himself altogether to evangelist work. After the Civil War he became general missionary of the Y. M. C. A. in Chicago. A church erected for his use became known as the Chicago Tabernacle, and subsequently was the headquarters of the Chicago training school for lay Christian workers and foreign missionaries. In 1871 Mr. Moody became associated with Ira D. Sankey, and in 1873 they visited Great Britain together, and began their first great series of public revival meetings, attaining a success unequalled since the days of Whitefield. On their return to the United States in 1875, Messrs. Moody and Sankey held a

similar series of meetings in the chief cities, achieving unparalleled success, and they worked together in this way until Mr. Moody's death. Meanwhile Mr. Moody undertook in 1880 the erection of buildings for his Northfield Seminary and his Mt. Hermon Boys' School. At his death the buildings of the two schools numbered more than 50, and the pupils more than 1,000. At Northfield he also carried on large summer religious conferences for many years.

**Moody, John** (1868- ), American author and editor, was born in Jersey City, N. J., and was educated in the public schools. After a few years of newspaper work he entered the banking house of Spencer Trask & Co., in 1890, devoting himself chiefly to financial and railway statistics. In 1900 he founded *Moody's Manual of Railroads and Corporation Securities*, and in 1905 *Moody's Magazine*, of which he became editor. In connection with his financial writings and analyses he established a bureau of financial statistics for the use of business firms and banks. His writings include: *Truth About the Trusts* (1904); *Analyses of Railroad Investments* (1909); *The Remaking of Europe* (1921); *Profitable Investing* (1925); *The Long Road Home* (1933).

**Moody, William Henry** (1853-1917), American legislator and jurist. He was district attorney for the Eastern District of Massachusetts from 1890 to 1895. In 1895 he entered Congress as a Republican, and served until appointed Secretary of the Navy in President Roosevelt's Cabinet (May 1, 1902). He succeeded P. C. Knox as Attorney General of the United States (1904), and in that office superintended the prosecution of persons and corporations for violating the Interstate Commerce and Anti-Trust acts. In 1906 he became an Associate Justice of the U. S. Supreme Court. On the bench he showed profound knowledge, judicial fairness, and independence without disrespect for precedent. In 1909 he retired from active service on account of ill-health.

**Moody, William Vaughn** (1869-1910), American educator, poet, and dramatist, was born in Spencer, Ind. He was graduated (1893) at Harvard, and from 1895 to 1907 in the English department of Chicago university. His verse is characterized by lyrical movement, mastery of language, and finish of style, particularly his *Ode in Time of Hesitation*, published in 1900, which contains a noble tribute to Robert Gould Shaw. The keynote of his poems, as of his play, *The*

*Faith Healer*, is the struggle between doubt and faith.

**Moon**, a heavenly body revolving round the earth at a mean distance of 238,840 m., in a period of 27 days 7 hrs. 43 min. 11.5 secs. The phases of the moon, since she shines by reflected sunlight, depend upon her continually changing positions with regard to the sun and earth. Full and new moon occur respectively when the sun and moon are aligned oppositely, and on the same side of our planet. At quadratures the moon appears half illuminated or 'dichotomized'; she is said to be crescent in the first and fourth, 'gibbons' in the second and third quarters. The temperature of the lunar surface, considered by Langley to rise scarcely above the freezing point of water, has been shown by Very, in accordance with Lord Rosse's earlier view, to fluctuate probably from above  $100^{\circ}$  c. at lunar noon to  $-200^{\circ}$  during the long lunar night. The absence of an atmosphere intensifies this frigid condition. The suddenness with which stars vanish when occulted by the moon and the blackness of its shadows testify to an all but totally denuded state. The lunar surface is broken, not only by innumerable vents and fissures, but by ten distinct mountain ranges. Altogether, 479 craters and peaks have received names. The mass of the moon, being  $\frac{1}{81}$  that of the earth, is relatively far the greatest belonging to any satellite in the solar system. It corresponds to a diameter for the lunar globe of 2,162 m., and a mean density of 3.44 (water=1). Our satellite has a volume  $\frac{1}{49}$ , an area of less than  $\frac{1}{13}$  the terrestrial; and lunar gravity has one-sixth its power at sea-level. Our view of the moon, apart from the effect of librations, is limited to a single hemisphere. She keeps the same face always turned inward, because her rotation, on an axis deviating  $1\frac{1}{2}^{\circ}$  from perpendicularity to the ecliptic, proceeds synchronously with her revolution.

Solar disturbance tends, on the whole, to pull the moon away from the earth; it lessens the effective attraction between them by about  $\frac{1}{300}$ ; and the sidereal month is hence nearly one hour longer than it would be if the sun were removed. The moon's track expands and contracts in a period of one year; and the moon by turns gets ahead and falls short of her mean place by 11'. This, her 'annual equation,' was discovered by Tycho Brahe. The nodes of the lunar orbit, on the other hand, shift backward, though irregularly, through the sun's influence, performing

an entire circuit in 18.6 years. Laplace showed in 1787 that the progressive diminution in the eccentricity of the earth's orbit involves a corresponding enfeeblement of the sun's disturbing power, permitting the moon to draw continually nearer to the earth, and to travel faster. She has hence gained in longitude by about  $1^{\circ}$  since the beginning of the Christian era. But after some 25,000 years the process will be reversed, as the terrestrial path regains a more oval shape.

Galileo constructed the first map of the moon. The actual system of lunar nomenclature was originated by Riccioli in 1651. Lunar photography was successfully prosecuted in this country from 1850 by Bond, H. Draper, and Rutherford, and in Great Britain by De la Rue. The first complete photographic lunar atlas was issued by W. H. Pickering in 1903.

**Mooney, William** (1818-94), English philanthropist, having become totally blind at twenty-one, invented the embossed type which bears his name.

**Mooney, James** (1861-1921), American ethnologist, born Richmond, Ind.

**Mooney, Thomas J.** (1881-1942), labor leader and central figure of the cause celebre known as the Mooney case. He was convicted in 1917 of murder in the first degree for the death of ten persons in an explosion during the 1916 preparedness parade in San Francisco. Evidence that testimony against Mooney had been perjured led President Wilson to investigate and then to urge a new trial. In 1919, on Wilson's urging, the Governor of California commuted the sentence to life imprisonment. In 1935 the case was still before the California courts.

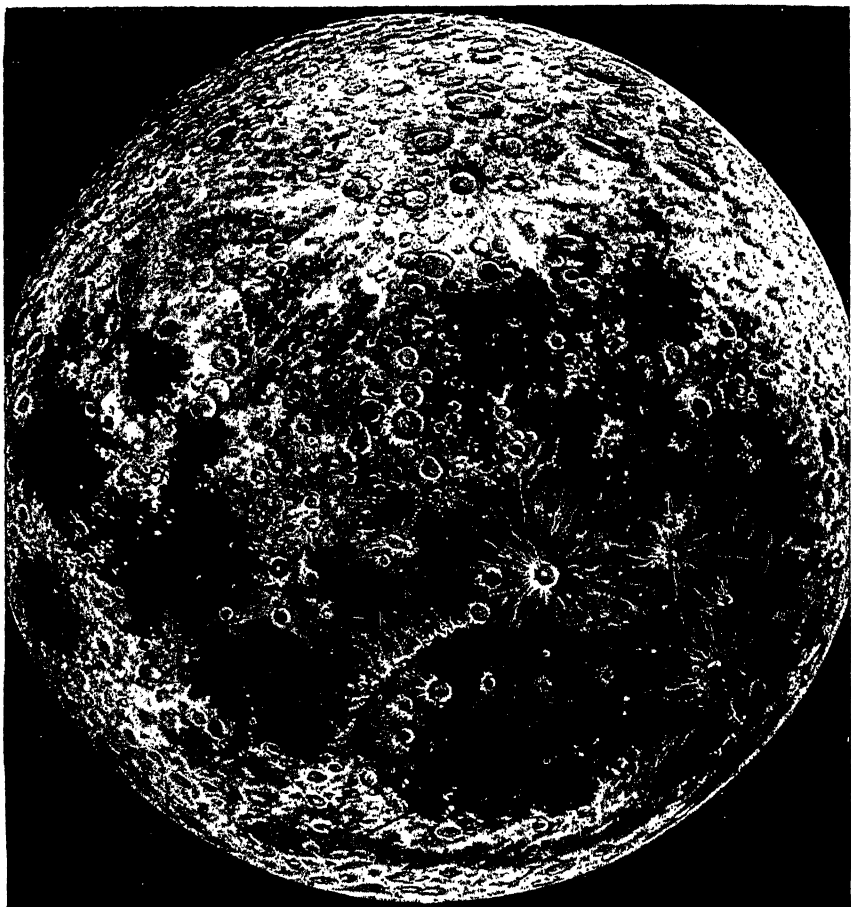
Five California Governors refused a pardon. In 1918, the United States Supreme Court refused a review. A similar decision in 1935 gave more hope to Mooney's supporters, since the courts refusal was based on the ground that Mooney had not exhausted every legal remedy in California.

Mooney steadfastly declined to ask for parole, on the ground that to do so would be tacit admission of guilt. Key witnesses in the case recanted their original testimony and every living member of the jury voting the original conviction has urged a new trial.

In January, 1939, Culbert L. Olson, newly inaugurated governor of California, pardoned Mooney.

**Moon-eye.** The lake herring or cisco.

**Moonstone**, a variety of the feldspars which has an opalescent reflection and sometimes a delicate play of colors.



*Map of the Moon.*

**Moore, Clement Clarke** (1779-1863), Am. poet, taught in General Theol. Seminary; wrote *'Twas the Night Before Christmas*.

**Moore, George** (1852-1933), British novelist, a disciple of Flaubert, de Maupassant and Zola. The chief among his novels are *A Mummer's Wife* (1884); *Evelyn Innes* (1898); *The Brook Kerith* (1916) and *Heloise and Abelard* (1918).

**Moore, Grace**, (1901- ), soprano, was born in Jellicoe, Tenn. She studied under masters in Europe and America, appeared in Broadway musical successes and later sang in Paris and Nice, and was with the Opera Comique, Paris. She made her debut, 1928, Metropolitan Opera Co., and has since starred in motion pictures including *Jenny Lind*, *New Moon*, *One Night of Love*.

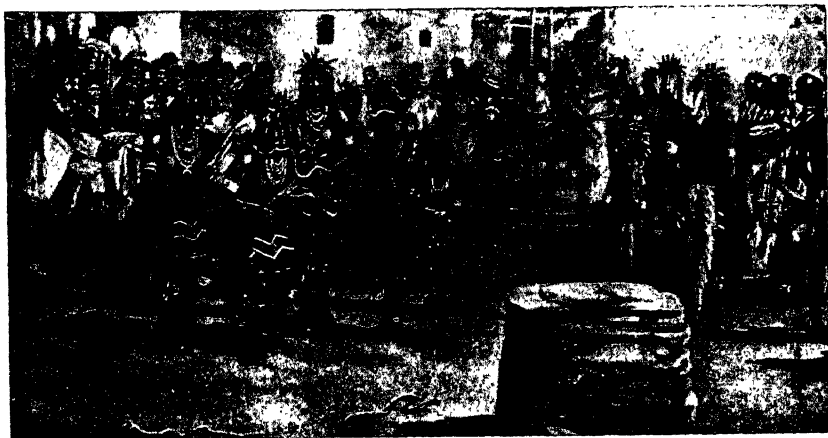
**Moore, John Bassett** (1860- ), American international lawyer, born Smyrna, Del., and educated at the University of Virginia. He was a member of the Hague Tribunal from 1913, and in 1921 became a judge of the Permanent Court of International Justice, from which he resigned in 1928, being replaced by Mr. Charles Evans Hughes. From then on Mr. Bassett devoted himself to complete his great history of arbitration, upon which he had been engaged for 42 years. Having taken part in numerous international conferences, his wide experience found a valuable outlet in his writings.

**Moore, Richard Bishop** (1871-1931), American chemist and radium expert, received his collegiate education in London, Paris and Chicago. Transferred to the

Bureau of Mines in 1912, as physical chemist directing metallurgy and chemistry of rare metals, he was authorized, at his own initiative, to establish an experiment station for rare metals at Denver, Col., and in 1913 first suggested that radium be produced in the United States. Developing his own technique for extracting the radium, Moore founded the National Radium Institute with a plant at Denver. There, under his direction, radium was produced having a market value of almost \$1,000,000 per ounce. He also originated the use of helium for airships in place of the inflammable hydrogen, and devised a process which enormously reduced the cost of helium, now exclusively used in American dirigibles. While at the

*Odes on Cash* (1828). *The Epicurean*, a prose romance after the style then in vogue, appeared in 1827; a life of Sheridan in 1825; an edition (with a biography) of Byron's *Letters and Journals* in 1830; a life of Lord Edward Fitzgerald in 1831; and a *History of Ireland* (in 4 vols.) in 1835-46.

**Moore's Creek, Battle of**, a battle or skirmish of the American Revolution, fought on Feb. 27, 1776, on Moore's Creek, in North Carolina, between about 1,600 Loyalists, mostly Scotch Highlanders by birth or descent, under Gen. Donald McDonald, and about 1,000 North Carolina militia under Col. Richard Caswell. McDonald's force had been raised at the instance of the refugee royal governor Martin, and was on its way



*Snake Dance of the Moqui Indians.*

Bureau of Mines he discovered mesothorium, used for luminous paints.

**Moore, Thomas** (1779-1852), Irish poet, was born in Dublin. In London his personal charm gained him influential friends, and in 1803 he was appointed admiralty registrar at Bermuda. He tired of the work there in a year, and entrusting it to a deputy, came to the U. S., where he travelled extensively during 1804. In 1807 Moore began the publication of his *Irish Melodies*, which contain his best work, for he was there thoroughly in sympathy with his subject. *Lalla Rookh*, his other most notable work, a clever 'Oriental' poetical romance, appeared in 1817, and ran through six editions in the same year. For a time he made a success with political squibs such as *The Fudge Family in Paris* (1818), *Fables for the Holy Alliance* (1823), and

to join Martin and meet Gen. Clinton, then expected with a large force of regulars, at Wilmington, when it was met and totally defeated in a half-hour's engagement at the bridge over Moore's Creek, by the militia.

**Moor-hen.** See **Rail**.

**Moorings**, means whereby a vessel is held in place at a wharf or at anchor. Ships may be moored to a wharf by means of ropes or chains, or to anchors; in the latter case two or more anchors are used. Permanent moorings are placed in many harbors. The chains from the anchors are carried to buoys so that ships using these moorings do not have to let go their own anchors, but secure to the buoy or to the end of the chain which the buoy marks or supports.

**Moorland**, an association of plants in which peat is an important element. More



common terms in America are swamps, peat bogs, marshes, meadows, and Sphagnum ponds.

**Moors**, a mixed race of N. Africa, containing an Arab or Semitic element, and a Berber or Hamitic element, represented by the Kabyle tribes, which are chiefly nomadic. Historically the Moors are best known as the invaders and conquerors of Spain. (See CALIF. and SPAIN.)

**Moose**. This, the largest of the deer family, is the American form of the European elk—*Alces machlis*. On this continent the moose is found from New Brunswick to Western Alaska, wherever unfrequented forests remain, or the protection of game-laws is afforded. It is a huge, ungainly, immensely strong animal, blackish-brown, with pale legs and belly, and a neck so short that it can graze only by kneeling. A very large bull may stand  $6\frac{1}{2}$  to 7 ft. high at the withers. The long and narrow head ends in an overhanging, flexible muzzle, which can be curled around a twig like a proboscis. On this massive head and neck the bulls carry a pair of great flattened antlers, always surprisingly wide in spread, but varying greatly in weight, and that irrespective of the relative bigness of the animal. Consult Roosevelt, *The Deer Family* (1902); Hornaday, *Am. Natural History* (1904).

**Moosehead Lake**, largest lake in Maine. Altitude, 1,023 ft. The region is a favorite resort for sportsmen.

**Moosejaw**, city, Saskatchewan, Canada, on Moosejaw River. It is in a wheat growing district, and has manufactures of lumber, structural iron, etc.; p. 21,244.

**Moose, Loyal Order of**, a secret fraternal and benefit association, founded in Louisville, Ky., in 1888. The Order maintains a large farm at Mooseheart (near Aurora), Ill., for the benefit of dependent members, orphans, and widows.

**Moplas**, a low-caste people of the Calicut district, Malabar coast, India. All are Mohammedans, and claim descent from Arab immigrants. The true Moplas number about 1,000,000.

**Moquegua**, town, Moquegua department, Peru. It has suffered frequently from earthquakes, especially in 1715 and 1868; p. 6,000.

**Moqui, Moki, or Hopi**, a tribe of Pueblo Indians residing in several villages near the boundary line between Arizona and New Mexico, which were probably living in these same villages when visited by Coronado in 1541. Their religious life is marked by elabo-

rate ceremonials, of which the best known is the Snake Dance. See PUEBLOS. Consult Dorsey's *Indians of the Southwest*; Reports of the U. S. Bureau of Ethnology.

**Moradabad**, or **Muradabad**, town, capital of district of same name, United Provinces, India. Noted for engraved metal ware and cotton goods. It has ruins of Rustam Khan's fort, dating from the foundation of the town in 1625; p. 81,168. Area of district, 2,281 sq. m.; p. 1,200,000.

**Moraines**, the masses of rock which, by atmospheric action, are separated from the mountains bounding the valleys along which glaciers flow, find a temporary resting place on the surface of the ice, at the margin of the glacier, and are carried along with it, but so slowly that they form a continuous line along each margin. These lines of *débris* are called *lateral moraines*. When two glaciers unite, the two inner moraines unite also and form one large trail in the middle of the trunk glacier, and this is called a *medial moraine*. A large portion of these rocky fragments at length reach the end of the glacier, and here the melting ice leaves it as a huge mound, which is known as a *terminal moraine*. The rock *débris*, sand, clay, gravel, etc., which are dragged forward underneath the ice, are called *ground moraines*. See GLACIATION.

**Morality**, or **Morality Play**, a type of popular drama which arose at the end of the 14th century. It was similar to the miracle play (see MIRACLE PLAY), but the characters were abstractions instead of the personages of Scripture history or saintly legend. Of those which still exist, the most important are *The Pride of Life*, *Mankind*, and *Everyman*, revived with great success in England and the United States by the Ben Greet players. See DRAMA. Consult A. W. Pollard's *Miracle Plays, Moralities, and Interludes*.

**Moratorium**, a postponement, by legislative act or proclamation, of the time at which debts or contract obligations become payable. The period of delay varies according to circumstances, and its application may be limited to long bills of exchange or may include sight drafts and other indebtedness. It is held to be internationally valid. The conditions necessitating the declaration of a moratorium are usually trade disturbances. As the mass of international commerce has increased, universal cash payment has become impossible and the credit system has been adopted, its chief machinery being the use of bills of exchange. When for any reason credit is endangered, banking and accepting houses have

refused to discount fresh bills, thus destroying the cash balance of foreign houses in their city. Foreign remittances therefore cease, and houses in good standing are likely to be through inability to meet their obligations, threatened with bankruptcy. Under such circumstances, a moratorium, by providing time for plans to meet the emergency, may prevent universal ruin. As a sign of insolvency, however, it tends to aggravate the collapse of credit, and is, therefore, resorted to only in extreme cases.

The occasion of a moratorium may be a natural calamity, a monetary panic, or a political or industrial upheaval. The first case is illustrated by the moratorium declared by France in 1910 on the occasion of the Paris floods, the second by the Argentine moratorium of 1891; and the third by the moratoria issued by the belligerent nations at the outbreak of the European War in 1914. The first moratorium of the Great War was put into effect in England by proclamation on Aug. 2, 1914, and was applicable only to bills of exchange not payable on demand. On Aug. 3 Parliament passed the Postponement of Payments Act, to remain in force for six months, authorizing the king by proclamation to suspend temporarily the payment of contract obligations; a general moratorium was proclaimed on Aug. 6, under the authority of this act; and others were declared on Aug. 12, Sept. 3, and Sept. 30. A second measure, known as the Courts (Emergency Powers) Act, was passed on August 31, 1914, granting the courts full discretionary powers with respect to the application of the law whenever any possible doubt should arise. Canada enacted moratory laws very generally similar to those in England.

In France moratory measures were passed as soon as that country entered the war and these were shortly afterward expanded and improved. During the first month of the war Germany enacted various ordinances generally similar to those of the other warring nations, but did not put into effect any general moratorium, though special privileges were granted to those in active military service. Moratoria covering varying periods were also declared by most of the other belligerent countries and by many neutrals.

When the United States entered the war, finances were practically already on a war basis, and no federal moratory legislation seemed necessary. But as active preparations proceeded, and hundreds of thousands of men entered the military and naval service, it be-

came important that legal protection be given those who in good faith had incurred financial obligations which, temporarily, at least, they could not meet. Massachusetts and Maryland were among the first States to take moratory action. Maryland enacted moratory measures in June 1917, and similar measures were adopted by other States. The most important legislation touching the moratorium, in the United States, was the Soldiers' and Sailors' Civil Rights bill, popularly known as the Federal Moratorium bill, approved March 8, 1918. This measure was designed to take precedence over the State laws already mentioned, and to fulfil their functions along broader and more effective lines. Two noteworthy features regarding the life insurance section of this bill provided that soldiers and sailors must make formal application to the War Risk Bureau, with respect to postponement of premium payments, whereupon the Bureau should make the necessary arrangements with the insuring company; and that the Government should temporarily reimburse the insuring company for losses through non-payment of premiums.

The most far-reaching moratorium of recent years has been the so-called Hoover Moratorium of 1931, for which President Hoover issued a call on June 20, following gold and exchange withdrawals from the German Reichsbank which, in spite of credits extended by the banks of England, France, and New York, threatened a most serious financial crisis. (For the terms of the Hoover Moratorium, see REPARATIONS.) On August 11, 1931, representatives of Germany, France, Italy, Great Britain, and Japan signed a protocol embodying in the Young Plan this agreement of postponement of reparations payments for one year in order 'to give the forthcoming year to the economic recovery of the world.' (See also GERMANY.) This moratorium gave such wide publicity to such a measure as a method for endeavoring to prevent financial crises and bankruptcy that it has since been adopted in more limited situations in an effort to give time for recovery.

**Moravia**, former margravate of Austria, later a part of the former Czechoslovak Republic, is bounded on the n.e. by Silesia, on the s.e. by Slovakia, on the s. by Austria, and on the n.w. by Bohemia. The total area is 8,612 sq. m. The climate is pleasant. Agriculture is the chief occupation, and the principal products are rye, oats, barley, wheat, corn, flax, sugar beets, and hay. Stock raising is important, and poultry, especially

geese, are raised. Coal, iron ore, graphite, and lignite are mined. Industries include the manufacture of woolen, linen, and cotton goods, the production of leather, machinery, beet sugar, spirits, beer, cigars, and cigarettes. The population numbers 2,662,884. The Munich Conference awarded the lesser part of it to Germany, 1938, and Germany grabbed the remainder along with Bohemia, in 1939.

The middle of the 6th century the present district of Moravia was invaded and occupied by the Slavs, who gave it the name of Moravia from the River Morava (March). In the 9th century the inhabitants were converted to Christianity by two Greek monks, Cyril and Methodius. For many years the Moravian kingdom recognized the suzerainty of the German emperors, until in 1029 it was incorporated with Bohemia. In 1526 it passed with the rest of Bohemia into the possession of the royal house of Austria. At the beginning of the Great War (1914) the inhabitants refused to join forces with the Central Powers. A provisional government was set up in Paris (1916) by the combined Czechs and Slovaks, and Moravia became a part of the new Czechoslovak state.

**Moravians, Moravian Brethren**, or, more correctly, **The Unity of the Brethren**, a body of Christians tracing their origin to the Bohemian Brethren, originating in Moravia in the 15th century. The Moravians have no formal creed apart from the Holy Scriptures, which they accept as the only rule of faith and practice. They maintain fraternal relations with other churches, and are known for their catholicity of spirit, and for their educational and missionary zeal. The form of worship is in general liturgical, though not universally so. The government of the church is democratic, though its orders are strictly episcopal. The entire body is organized in four provinces—German, British, and American, North and South. An extensive missionary work is carried on, and various educational institutions are maintained. Among these are the Moravian colleges for men and women at Bethlehem, Pa., and Salem College for women at Winston-Salem, N. C.

Historically, this body dates from the Council of Basel (1433), which caused a complete separation between the two parties of Hussites—the Calixtines and the Taborites; the former drew toward the Roman Catholic Church, while the latter formed themselves into a distinct community, under the name of the Bohemian and Moravian

Brethren. Their first bishop was chosen by lot in 1467, and the union rapidly increased under the leadership of Lucas of Prague (d. 1528) until at the opening of the 16th century it numbered some four hundred congregations. In the United States the first Moravian settlement was in Georgia in 1735, but that field was soon abandoned for Pennsylvania, where settlements were made at Bethlehem, Nazareth, and Lititz.

**Moray (Murray), James Stewart, Earl of** (1531-1570), regent of Scotland, natural son of James v. by Lady Margaret Erskine. He signed the letter to Knox in March, 1556, inviting him to return from Geneva. It was mainly through his diplomacy that aid was given by Elizabeth which counterbalanced that obtained by the queen regent from France, and led to the removal of foreign troops from Scotland. After the return of Queen Mary to Scotland the administration of affairs was mainly left in Lord James' hands; and in 1562 she conferred upon him the earldom of Moray. When Mary brought matters to a crisis by giving her hand to Darnley (1565), Moray was compelled to take refuge in England. He returned to Scotland after the murder of Rizzio and was chosen regent. On the escape of Mary from Loch Leven (1568) he continued to govern the country with prudence and skill until he was shot dead at Linlithgow.

**Moray Firth**, an arm of the North Sea, on the n.e. coast of Scotland, between Duncansbay Head in Caithness-shire and Kinnaird's Head in Aberdeenshire. It is noted for its fishing. It has a width of 16 m. at its entrance, and extends s.w. for nearly 40 m.

**Morbihan**, French department forming the s.e. portion of Brittany, lies along the north shore of the Bay of Biscay. The climate, owing to maritime influence, is most equable. The peasants breed cattle and keep bees. The fisheries (especially of sardines) and oyster culture are important. The capital is Vannes; the most important town is L'Orient. Area 2,738 sq. m.; p. 543,175.

**Mordants**, compounds capable of uniting with dyestuffs to form insoluble pigments, and thus, if the reaction is made to take place in fibers of a fabric, fix the color in it. Mordants are mostly used in cotton and wool dyeing, and are commonly solutions of salts of iron, aluminum, chromium, and tin.

**Mordecai, Alfred** (1804-87), American soldier, was a member of the Board of Ordnance at Washington from 1839 to 1860, and became major of ordnance in 1854. On be-

half of the Government he investigated European arsenals, ordnance, and military organizations in 1840 and 1855, and in 1860 assisted in revising the curriculum at West Point.

**Mordecai, Alfred** (1840-1920), American soldier, born in Philadelphia, son of Major Alfred Mordecai. He served with distinction in the Civil War; was instructor in ordnance and gunnery at the U. S. Military Academy from 1865 to 1869, and was later in command of the Leavenworth Arsenal (1870-4), Watervliet Arsenal (1881-6, 1898-9), New York Arsenal (1887-92), Springfield Armory (1892-8), and Benecia Arsenal, Cal. (1899-1902).

**Mordvins**, a Finnish people of Eastern Russia, scattered along the central Volga basin from Nijni-Novgorod to Saratov, and numbering in all about 1,000,000. They are of moderate height, robust and enduring, with dark or auburn hair, blue eyes, round heads, oval faces, fair skins. Agriculture, carpentry and wood working, and bee keeping are the chief industries.

**More, Paul Elmer** (1864-1937), American author and critic, was born in St. Louis, Mo. In 1895-7 he was professor of Oriental languages and classical literature at Bryn Mawr. In 1901 he became literary editor of the *Independent*, and from 1903 to 1914 he was literary editor of the New York *Evening Post*. In 1906 he accepted a similar position with the *Nation*, from which he resigned in 1914. He was a member of the American Academy of Arts and Letters. Most of his essays on English and other literatures are included in the *Shelburne Essays* (1904-15). He also published: *The Great Refusal* (1894); *Life of Benjamin Franklin* (1900); *Nietzsche* (1912); *Platonism* (1917); *Hellenistic Philosophies* (1923); *The Christ of the New Testament* (1924); *The Demon of the Absolute* (1928); *The Catholic Faith* (1931).

**More, Sir Thomas** (1478-1535), English author and statesman, was born in London. At Oxford he was a pupil of Colet, with whom he formed a close friendship. In London he met Erasmus, and for him conceived a memorable affection. He became master of requests (1514), treasurer of the exchequer (1521), and in 1523 Speaker of the House of Commons. On the fall of Wolsey, 1529, More, against his own strongest wish, was appointed to the office of Lord Chancellor. In the discharge of his office he displayed a primitive virtue and simplicity, being 'ready to hear every man's cause, poor and rich,

and keep no doors shut from them.' The one stain on his character as judge is the harshness of his sentences for religious opinions. On the questions of the royal supremacy and the divorce he was at variance with Henry VIII. The disapproval of his policy by such a man as More could not be disregarded by Henry, and his death became a mere matter of time and policy. The opportunity came in



Sir Thomas More.

1534. In that year Henry was declared head of the English Church; and More's steadfast refusal to recognize any other head than the Pope led to his commitment to the Tower. He was found guilty of high treason, and was beheaded (July 6, 1535). The serenity and even the homely wit, which were part of his character, he carried with him to the end. By far his most important work was *Utopia* (1516), a sketch of an ideal commonwealth, wherein religion is pure theism, toleration is almost absolute, a sort of communism is established and social life is regulated according to the dictates of right reason, as that reason presents itself to the natural man. The Roman Catholic church has canonized him.

**Moreau, Jean Victor** (1761-1813), French general under Napoleon. He was offered the dictatorship by the party which overthrew the Directory, but refused it, while he lent Bonaparte his support in his *coup d'état*. He was appointed again to the command of the Army of the Rhine, and he drove the Austrians headlong before him, defeating them at Hohenlinden (1800). His great popularity and reputation made him an object of suspicion to Napoleon, by whom he was accused of participating in the plot of Cadoudal. He

was degraded, and sentenced to two years' imprisonment, which was commuted to banishment. He came to the U. S. in 1805 and settled near Trenton, N. J., later removing to Morrisville, Pa., where he lived until 1813 when he returned to Europe to assist the allies against Napoleon.

**Morena, Sierra**, mt. range (7,900 ft.) of S. Spain, dividing the valleys of the Guadiana and the Guadalquivir. Lead, silver, quicksilver, and coal exist, and tin ore is mined at Rio Tinto in the w.

**Moretto, Il**, whose true name was **Alessandro Bonvicino** (c. 1498-c. 1555), Italian painter. His masterpiece is the *Assumption*, in the church of San Clemente, Brescia.

**Morey Letter**, a famous forged letter, falsely attributed to Gen. Garfield, and issued in the last days of the presidential campaign of 1880 for the purpose of turning voters from Garfield. The letter, addressed to a mythical person named H. L. Morey, Employers' Union, Lynn, Mass., virtually favored Chinese labor because it was cheap. Though Garfield immediately denounced the letter as a forgery, it was lithographed and circulated broadcast, particularly in the Pacific states, where opposition to Chinese labor was strongest, and undoubtedly induced many who would otherwise have voted for Garfield to cast their votes for his Democratic opponent, Hancock.

**Morey, Samuel** (1762-1843), American inventor, born at Hebron, Conn. For many years he carried on a series of experiments in steam navigation on the Connecticut river. In 1793 he fitted out a small boat with a steam engine and made a short trip between Oxford and Fairlee, Vt. Later he went to New York and built other paddle-wheel steamboats. One was exhibited at Philadelphia in 1797.

**Morgain**, or **Morgue le Fay**, sister of King Arthur and mother of Ywain, may be called the witch, as Merlin is the wizard, of Arthurian legend. In her character of queen of Avalon, Morgain is represented as carrying off Arthur to be healed of his wounds.

**Morgan, Charles Langbridge** (1894-), English novelist and dramatic critic. In 1926 he became chief drama critic of the *London Times*. He is the author of several novels, including *Portrait in a Mirror* (1929); *The Fountain* (1932); *Sparkenbroke* (1936); and *The Empty Room* (1941). *The Fountain* was a 'best seller.'

**Morgan, Daniel** (1736-1802), American

soldier, born in Hunterdon co., N. J. He moved to Virginia in 1753, was a wagoner in Braddock's expedition, 1755, and served with the Virginia militia at various times during the French and Indian War. When the news of the battle of Lexington was received (1775), he raised a company of riflemen and marched them to Boston, was second in command to Arnold in the march to Quebec, and played an important part in the operations resulting in the surrender of Burgoyne at Saratoga, Oct. 17, 1777, and in later engagements of the Revolution.

**Morgan, Edwin Dennison** (1811-83), American politician. He was in the state Senate (1850-53) and was governor of New York (1859-63). Morgan joined the Republican party at its foundation and was chairman of its national committee during the campaigns of 1856, 1860, 1864, and 1872. He was in the United States Senate in 1863-69.

**Morgan, George Washbourne** (1822-92), organist, born in England. He settled in New York and had charge of the music in Grace Protestant Episcopal Church (1855-68) and St. Stephan's Roman Catholic Church (1869-70). From 1870 to 1882 he was organist of the Brooklyn Tabernacle.

**Morgan, John Pierpont** (1837-1913), American banker, was born in Hartford, Conn. In 1860 he was appointed American agent for George Peabody & Co. of London. He was a member of Morgan & Co. from 1871 to 1895, when the firm was reorganized under its present name of J. P. Morgan & Co. On his father's death, he became head of the London firm, and of Morgan, Harjes & Co. of Paris. Morgan took an important part in railroad reconstruction, industrial and financial consolidation, and national and international finance. After 1900, Morgan's interest in the building up of large enterprises expressed itself in the formation of the U. S. Steel Corporation, capitalized at \$1,300,000,000 (1901), of the International Harvester Corporation and the International Mercantile Marine (1902), and other combinations; and in amalgamations among the financial institutions that came under his control.

Morgan's direct connection with government finance on a large scale began in 1878-9, when, with August Belmont, he marketed \$260,000,000 worth of U. S. bonds. The United States first participated in foreign loans through the Morgan firm, which negotiated loans to Mexico (1899), England (1901), Japan, China, and Latin America. As commodore of the New York Yacht Club, he

was the leading spirit in the building of the *Columbia*, which defeated the *Shamrock* in 1899 and in 1901. He was a collector of paintings, porcelains, coins, rare books and manuscripts. Morgan founded and endowed the New York Lying-in Hospital, and made large donations to the Cathedral of St. John the Divine, the New York Trade Schools, and the Harvard Medical School.

**Morgan, John Pierpont, Jr.** (1867-1943), son of the preceding. Upon the death of his father he became active head of J. P. Morgan & Co., of which he had been a member since 1891. In the year following the elder Morgan's death the World War began and the company became purchasing representative in this country for munitions and other materials required by the British and French governments to the extent of billions of dollars. Before this country entered the war the Morgan firm also financed a large part of the Allies' credit requirements in the United States, arranging \$1,550,000,000 in loan issues to Great Britain and France. Huge post-war loans also were negotiated through the Morgan company, including those to Germany under the Dawes Plan. In 1920 he presented his London residence to the United States Government for use as its embassy, and in 1923 he endowed his father's library as an institution for research. Details of the Morgan business were made public for the first time in its history when Mr. Morgan and several of the partners testified before a Senate Committee investigating banking practices. In 1935 Mr. Morgan, "for the purpose of simplifying the settling of his estate," disposed of some of his real estate holdings on Long Island and certain valuable items of his extensive art collection.

**Morgan, Lewis Henry** (1818-81), American anthropologist, was born in Aurora, N. Y. He made a study of the Indian tribes, especially the Six Nations. His researches resulted in the publication of his famous papers on consanguinity.

**Morgan, Thomas Hunt** (1866), American embryologist, was born in Lexington, Ky. He was professor of biology at Bryn Mawr College, 1891-1904, and professor of experimental zoology at Columbia University, 1904-1928. Since 1928 at Cal. Inst. of Technology.

**Morganatic Marriage** is a marriage contracted by a member of a royal family with a woman of inferior rank; also, in Germany between a woman of high rank and a man of inferior position.

**Morgenthau, Henry** (1856- ), lawyer

and diplomat was born in Mannheim, Germany. Ambassador to Turkey, 1913-16; in charge of interests in Turkey during the World War; head of American Commission to investigate conditions in Poland.

**Morgenthau, Henry, Jr.** (1891- ), secretary of Treasury, was born in N. Y. City. Chairman Federal Farm Board, 1933; became secretary of Treasury Jan. 1, 1934.

**Morghen, Raffaello** (1758-1833), Italian engraver, was born in Florence. He engraved (1781) Raphael's figures (*Poetry, Theology*) in the Vatican, and reproduced the principal works of Guido, Titian, Correggio, Poussin, Murillo. Invited by Ferdinand III., grand duke of Tuscany, to Florence (1793) to found a school of engraving, he produced there his best copies.

**Morgue**, a place in which unidentified bodies are exposed for identification.

**Moriscos**, the Moors who remained in Spain after the conquest of Granada by Ferdinand of Castile. Their expulsion, in 1609-10, when they numbered 500,000, lost to Spain an army of efficient artisans and farmers.

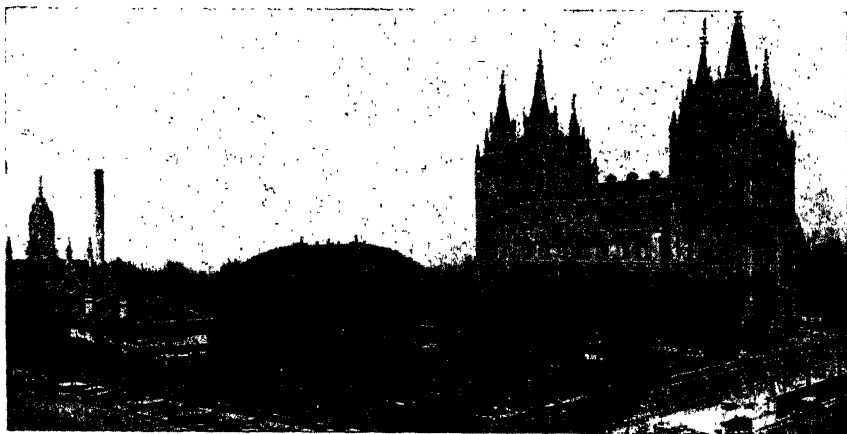
**Morland, George** (1763-1804), English painter, was born in London. He is chiefly celebrated for his animal painting and scenes of country life; but he executed also graceful and unaffected domestic scenes, such as *The Tea Garden*. His *Old English Sportsman*, and *Dogs Fighting*, are owned by the New York Historical Society, while the *Midday Meal*, and *Weary Wayfarers*, are in the Metropolitan Museum of Art.

**Morley, Henry** (1822-94), English author, was born in London. He edited Morley's Universal Library (63 vols.), Cassell's National Library (214 vols.), A Library of English Literature, Carisbrooke Library (reprints of classics), and Boswell's *Life of Johnson*.

**Morley, John Viscount Morley of Blackburn** (1838-1923), English statesman and author, born in Blackburn. In 1867 he succeeded George Henry Lewes as editor of the *Fortnightly Review*. In 1883 he resigned this editorship, as well as that of the *Pall Mall Gazette*, which he had held since 1880. He then became editor of *Macmillan's Magazine* till 1885. His biographies are *Edmund Burke, an Historical Study* (1867); *Voltaire* (1871); *Rousseau* (1873); *Diderot and the Encyclopedists* (1878); and *Richard Cobden* (1881). His other chief works are: *The Study of Literature* (1894); *Oliver Cromwell* (1900); and *Life of Gladstone* (1903). Mr. Morley's active political career began in 1883, when he was elected for Newcastle-on-

Tyne. When Gladstone came into power, in January, 1886, Mr. Morley was appointed Chief Secretary for Ireland with Cabinet rank. He favored a colonial type of government for Ireland, and during the debates on the second Home Rule Bill (1893) played a part second only in importance to that of Mr. Gladstone himself. In December, 1905, he was appointed Secretary of State for India. He resigned in 1910, to become Lord President of the Council of Great Britain, a position he filled until 1914 when owing to his views on war he resigned and devoted the rest of his life to literary pursuits.

president of the group, although a few dissatisfied members started the Reorganized Church under Joseph Smith 3rd in 1852. Under Young the Mormon group journeyed across the plains and settled near the Great Salt Lake. Salt Lake City was founded in 1847, and after the treaty with Mexico, the Mormons tried to enter the Union as the 'State of Deseret,' but their commonwealth was admitted as the Territory of Utah (1850) and Young was appointed governor. From 1852, when the revelation on 'celestial marriage' was made public, to 1890, when the church forbade the practice, Utah was in



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Mormon Temple, Salt Lake City, Utah.

**Mormon, Book of**, an alleged translation (1827-9; printed in 1830) by Joseph Smith Jr. of a volume composed of gold plates eight by six inches, fastened by three golden rings, written in 'reformed Egyptian,' interpreted by the aid of two crystals (Urim and Thummim) set like spectacles in a silver bow. Its compilers were said to be the prophet Mormon and his son Moroni.

**Mormon Church**, a religious body now existing in two bodies—The Church of Jesus Christ of Latter-day Saints, and the Reorganized Church of Jesus Christ of Latter-day Saints, which have the same founder, Joseph Smith Jr., a farmer's son, who was born in Sharon, Vt. (1805). Smith gathered a group around him, which included Brigham Young. The Mormons made settlements at both Kirtland, O., and Navvoo, Ill., but were driven out because of popular feeling against them. Smith was killed by a mob in Carthage, Ill., in 1844. Brigham Young was chosen

conflict with the Federal authorities. The Edmunds Bill (1862) disfranchised polygamists, and in 1890 the court declared the church property forfeited because the church sanctioned polygamy and was in rebellion against the Edmunds law. In 1890 the church surrendered. Monogamist laws were accepted by the president and the church conference, acts of amnesty passed (1893-4), and Utah was admitted as a State (1896). Since that time plural marriage has been forbidden by the church.

The Zion's Coöperative Mercantile Institution is the most noted outcome of Mormon enterprise in trade, and the Big Horn Valley colony (Wyoming) the most recent successful extension. For an impartial view, Bancroft's *History of Utah*; Kennedy's *Early Days of Mormonism*.

**Morning-Glory** (*Ipomœa*), annual and perennial herbs or shrubs widely distributed in tropical and temperate regions. 1. *pomœa*

*purpurea* is an annual with a trailing stem, and white, blue, pink, purple, or variegated flowers which open in the morning and close during the heat of the day.

**Moro**, a name applied to the Mohammedan Malays inhabiting the southern part of the archipelago of the Philippines, including the whole of Mindanao and the Sulu Islands. Following the acquisition of the Philippines by the United States, the Sulu Archipelago was placed under military rule (1901), and in 1903 the Philippine Commission passed a law providing for the government of the Moro country of Mindanao and the adjacent islands.

practicable, and is carried on to some extent. The climate is temperate and healthful, but in the s.e. there are extremes of heat and cold. Fish are plentiful, and the fishing industry engages French, Spanish, and Portuguese boats. The country is rich in minerals, gold, silver, copper, lead, nickel, antimony, manganese, iron, iridium, petroleum and phosphates occurring in abundance. Agriculture and stock raising are the chief industries. The cereal crops include barley, wheat, maize, millet, beans, chick-peas, canary seed, cummin, and fenugreek. Other products are fruits, vegetables, and a small amount of tobacco. There



Copyright Burton Holmes, from Ewing Galloway, N. Y.

Morocco: The little Town of Taza.

Since that time, although disarmament has been carried out to a considerable extent, there have been several Moro uprisings and a number of clashes with the Philippine constabulary. One of the most serious occurred in 1913, in which General Pershing with a force of American troops and Filipino scouts defeated the rebellious Moros under Dato Amil. The tribes of the interior are chiefly agricultural, while the coastal tribes are largely engaged in the fishing industry, including the gathering of pearls.

**Morocco**, or **Marocco** (called by the natives *El Maghrib el Aksa*), an empire or sultanate in the n.w. part of Africa, with an area generally estimated at about 230,000 sq. m. The land, as a whole, is well watered; and though the rainfall is irregular, irrigation is

are nearly 20,000 acres of vineyards under cultivation.

Manufacturing is little developed. There are flour and saw mills. Italian paste, ice, and tobacco factories, brick and tile works, tanneries and electric-light plants, and manufactures of textiles, carpets, arms, and brass and copper articles for local trade; p. 600,000.

The Franco-Moroccan Treaty of 1912 established a French Protectorate over Morocco, excepting Tangier and its district, which is under international control, and the Spanish zone in the n. part. The Sultan is nominally the head of the state but is obliged to govern in accordance with the advice of the French resident general, whose seat is at Rabat.

The recorded history of Morocco commences in the 8th century, with the introduction of



Islam and the establishment of a branch of Mohammed's family—the Idrisi—contemporary with Haroun al-Raschid. In 1900 Abdul Aziz, who had succeeded to the sultanate in 1894, incurred the displeasure of his subjects by his ill-considered attempts to introduce European standards into Morocco. It was at this juncture that France, anxious to strengthen her position in Northern Africa, reached an agreement with Great Britain granting the latter a free hand in Egypt in return for a similar concession in regard to Morocco. Following a conference with German representatives, the Sultan rejected the French proposals and requested a general conference of the European powers. An international conference was held at Algeiras, Spain, in January, 1906, to regulate the affairs of Morocco, and to define the rights of the various powers therein.

In May, 1911, a revolt against certain taxes by some of the southern Berber tribes led to the despatch of a French force to Fez. Germany thereupon sent a warship to Agadir, a port not open to commerce, ostensibly to safeguard German interests, and the situation assumed a serious aspect. Diplomatic conferences followed; and on Nov. 4, 1911, France and Germany signed an agreement by which Germany conceded to France unlimited rights in Morocco, with about 20,000 sq. m. of territory then in dispute before The Hague Tribunal, in exchange for 96,000 sq. m. of the French Congo lying along the eastern boundary of the Cameroons, with water rights on the Ubang and Congo Rivers.

During the Great War, German efforts to start a general insurrection in French Morocco were unsuccessful. In 1921 the Riff tribes revolted against Spanish rule but were quickly subdued. Rebellion again broke out in 1923 and in 1924. In 1924 neutrality of the Tangier zone was established but in 1940 Spanish troops occupied it. March, 1941 Spain allowed Germany to use the ruler's palace in Morocco as a consular office. The Allies in November, 1942 occupied French Morocco.

**Moron**, the name given to those feeble-minded persons whose mentality is equivalent to that of a child of 12 years.

**Moroni, Gianbattista** (1525-78), Italian portrait painter, was born near Bergamo. His *Bartolommeo Bonga* and *Gentleman and his Wife* are in the Metropolitan Museum, New York, and he is represented in other American collections and European galleries.

**Morpheus**, in ancient Greek mythology the son of Somnus (Sleep).

**Morphia**, or **Morphine**,  $C_{17}H_{19}NO_3 + H_2O$ , is a monobasic tertiary alkaloid occurring in opium, of which it is the most active principle. Small doses, taken by the mouth or hypodermically, lessen the voluntary movements, and then produce drowsiness, which soon passes into light sleep. The special value of morphine is as a means of relief from pain, but its continued use is likely to be habit-forming.

**Morphology**, in the biological sciences, the study of form in its widest sense, as contrasted with physiology, the study of function. Its ultimate goal is the establishing of a classification which shall accurately represent our knowledge of the origin and relations of living organisms.

**Morphology in Plants** is the science which treats of the origin of the material structure of specific plants and their peculiar organs. It embraces also the comparative study of plants of different species in relation to their form and development. See BOTANY.

**Morphy, Paul Charles** (1837-84), American chess player, was born in New Orleans, La. He attended the first American Chess Congress in 1857, and defeated the assembled American players. At this time, also, he began to give exhibitions of his remarkable faculty of playing several games at once without seeing the boards, known as 'blindfold chess.'

**Morrill, Tariff Act**, an act framed and introduced in the House of Representatives by Justin S. Morrill, became a law on March 2, 1861. The disastrous panic of 1857 had caused a material decline in the receipts of the government, and this decline occasioned the framing and the passage of the act. Its intention, according to its chief author, was to restore the rates of 1846, although it substituted specific duties for the ad valorem duties of that year. Its most important duties were the increased duties on iron and on wool, and it was regarded by many as more beneficial to the agricultural than to the manufacturing classes. The Morrill Act itself raised imposts from 19 per cent. on dutiable articles to 36 per cent.

**Morris, Clara** (1849-1925), American actress, born (Morrison) in Toronto, Canada. She was taken as an infant to Cleveland, O. In 1869 she became leading lady at Wood's Theater, Cincinnati, and in the following year joined Augustin Daly's Fifth Avenue company in New York. While with Mr. Daly she played many parts, her most notable successes being in *L'Article 47* and *Alixé*.

**Morris, George Pope** (1802-64), American poet and journalist, was born in Philadel-

phia. He founded the New York *Mirror* with Samuel Woodworth in 1823, and began the publication of the *National Press* in 1845, soon changed to the *Home Journal*, of which Morris was editor until near the close of his life. He was the author of a number of popular songs, including 'Woodman, Spare That Tree!' He published a volume of prose sketches in 1839. A complete edition of his *Poems* was issued in 1860.

**Morris, George Upham** (1830-75), American naval officer, was born in Massachusetts. In the absence of his superior officer he commanded the frigate *Cumberland* when she was sunk by the *Merrimac* in Hampton Roads (March 8, 1862), fighting his ship until the guns were under water and she went down with colors flying.

**Morris, Gouverneur** (1752-1816), American statesman, diplomat, and financier, was born on Jan. 31, 1752, at Morrisania, N. Y. He was a member of the Provincial Congress which met in May, 1775, and took a prominent part in its proceedings. He drew up a report, which was adopted, in favor of the issue of paper currency by the Continental Congress, and was one of the committee appointed to receive Washington when the latter passed through New York on his way to take command of the army at Cambridge.

When the Continental Congress recommended the several Colonies to establish State governments, he championed the proposition in New York, and was chairman of the committee which reported, in March, 1777, a State constitution. At the end of 1777 Morris was chosen to the Continental Congress. He was shortly afterward appointed on a committee to visit the army at Valley Forge, and spent most of the winter at the camp. Morris was chairman of the committee appointed to confer with the British commissioners regarding Lord North's plan of conciliation, and he published in 1779 *Observations on the American Revolution*, containing an exposition of the causes of the war and an account of the discussions and correspondence with the British commissioners. He drafted the instructions to Franklin for the French mission; and drew up, as chairman of the committee to correspond with the American ministers abroad, a report and instructions which formed the principal basis for the treaty of peace in 1783. On the establishment of the new department of finance under Robert Morris, he was appointed assistant financier, an office which he held until 1785. The organization of the Bank of North America was largely his work. In the

convention of 1787, which framed the Federal Constitution, he sat with Robert Morris as a delegate from Pennsylvania, and it was to him that the preparation of the final draft of the Constitution was intrusted.

In 1792 Morris was appointed minister to France, not without strong opposition in the Senate. He returned to the United States in 1798, and from 1800 to 1803 was a member of the U. S. Senate from New York. He favored the purchase of Louisiana from France. On his retirement from the Senate he became a leader of the agitation for the construction of the Erie Canal. It was an unhappy ending of a brilliant career that he should have opposed the War of 1812 and lent his influence to the disunion movement in the North. He died at Morrisania on Nov. 6, 1816. His biography has been written by Jared Sparks and Theodore Roosevelt. Consult also his *Diary and Letters* (edited by Anne Cary Morris).

**Morris, Mary Philipse** (1730-1825), American beauty and Loyalist, was born in the Philipse Manor House on the Hudson. She said to have refused the hand of Washington in 1756. In 1758 she married Roger Morris, an English officer. During the Revolution she was attainted of treason and her property confiscated, but afterward she was granted \$85,000 by the British government in compensation.

**Morris, Robert** (1734-1806), American financier, was born in Liverpool, England, on Jan. 31, 1734. He came to America in 1748, and entered mercantile life in Philadelphia, which was thenceforth his home. In 1766 he became warden of the port of Philadelphia. In June, 1775, he was appointed a member of the Pennsylvania Council of Safety, and at once became active in its affairs. A contract (Sept. 18, 1775) between the secret committee of Congress and the firm of Willing & Morris for the importation of arms and ammunition was the beginning of the financial and commercial connection with the National Government which earned for Morris the title of 'the Financier of the Revolution.'

On Nov. 3 he took his seat in the Continental Congress, where he was placed on the secret committee through whose hands much of the principal business of Congress passed; and he subsequently served on many other committees, including that to establish a navy. His reputation as a financier, joined to his commercial experience, made him a leading member of Congress. When the advance of the British toward Philadelphia caused Congress to withdraw from the town, he became the

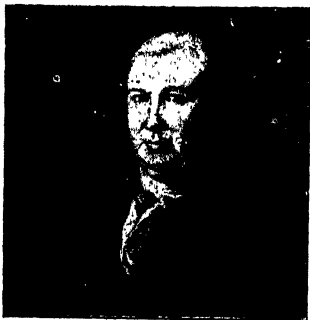
leading member of the committee upon whom the conduct of affairs there devolved. He remained at his post, being regarded as a sort of personal embodiment of the National Government. On Feb. 5, 1777, he was again chosen a delegate to Congress from Pennsylvania. On Feb. 20, 1780, Morris was chosen by Congress superintendent of the new department of finance. In spite of the enmity which his course had aroused, he was generally regarded as the only man able to deal with the extraordinary financial situation. On Dec. 31, 1781, the Bank of North America, embodying a plan which he had drawn up, was incorporated by Congress, and began business on Jan. 7, 1782. On Jan. 7, 1783, he submitted a plan for a national mint, which Congress approved. He was a delegate to the Annapolis convention in 1786, and a member of the convention of 1787 which framed the Federal Constitution, siding there with the friends of a strong central government. Washington offered him the Secretaryship of the Treasury, but he declined. In 1789 he was chosen U. S. Senator from Pennsylvania for the term of six years.

Morris had been active in land speculation in various parts of the country, and was interested in real estate in Washington, and by this time his affairs had become greatly involved. In December, 1797, he was arrested, and spent the time from Feb. 16, 1798, to Aug.

up a studio with Burne-Jones. In 1862 Morris gave up easel painting for the handicrafts, and established a firm for all sorts of household decoration. Among his partners were Rossetti, Burne-Jones, and Madox Brown;



William Morris.



Robert Morris.

26, 1801, in jail. His friends did not desert him, but his credit and standing were gone. He died at Philadelphia on May 8, 1806. Consult Gould's *Life of Robert Morris*; Hart's *Robert Morris, the Financier of the American Revolution*.

**Morris, William** (1834-96), English poet, artist, and socialist, was born in Walthamstow, Essex. Under the influence of Rossetti he abandoned architecture for painting, and set

but Morris was the moving spirit, and divided his energies between designing and the study of dyeing and other technical processes. He continued his literary work, publishing *Life and Death of Jason* (1867), and *The Earthly Paradise* (3 vols., 1868-70). In 1872 he took up his residence at the ancient manor-house of Kelmscott, Oxford, jointly with Rossetti; and in the year following published *Love is Enough. Three Northern Love Stories* (trans.) appeared in 1875, and in the same year he took over the entire business of the firm. In 1881 he added the tapestry industry to his business as a decorator. He became interested in politics, and took a leading part in the affairs of the Social Democratic Federation. He published a translation of *The Odyssey* in 1887, and *Poems by the Way* in 1891.

His publications in prose include *The Aims of Art* (1887); *The Well at the World's End* (1896); *The Story of the Sundering Flood* (1898). He attempted to awaken interest in artistic printing and book making by issuing a series of beautiful books from the Kelmscott Press, especially his great Chaucer volume illustrated by Burne-Jones (1896). Consult Cary's *William Morris: Poet, Craftsman, Socialist*

**Morris Dance**, a dance of Moorish origin, probably introduced into England by Queen Eleanor of Castile, where it became a rustic dance, adapted to village festivals and May games. It was suppressed by the Puritans, but a modified form still lingers in the n. of England.

**Morris Island**, an island at the southern entrance to the harbor of Charleston, S. C. It is of historic interest through having been the location of the batteries which took part in the bombardment of Fort Sumter at the opening of the Civil War. See SUMTER, FORT.

**Morrison, Robert** (1782-1834), English missionary, as the first Protestant missionary left for Canton, China, in 1807. In 1818 he established the Anglo-Chinese College at Malacca. His great work was a *Dictionary of the Chinese Language* (1815-23). He also wrote a Chinese grammar and translated the Bible.

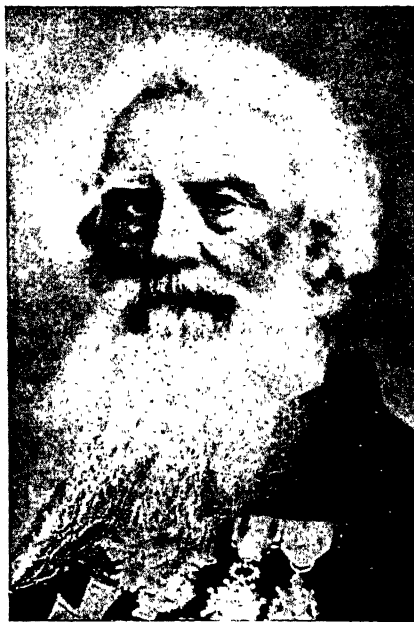
**Morristown**, town, New Jersey, county seat of Morris co., 22 m. w. of Newark. Situated at an elevation of about 700 ft.; there are many large estates and fine residences of New York business men. The old Ford mansion, occupied by Washington, is still standing, and is used as a museum by the State Historical Society.

Morristown is located in the peach belt and much of the land is devoted to market gardening and fruit growing. There are also large greenhouse establishments engaged in growing flowers for the New York market. In 1740 it was renamed in honor of Lewis Morris, the governor of the State. Washington twice made the town his headquarters; p. 15,270.

**Morro Castle**, a noted fortress located upon a promontory at the entrance to the harbor of Havana, Cuba; also a fort upon a hill commanding the entrance to the harbor of Santiago, Cuba.

**Morrow, Dwight Whitney** (1873-1931), American lawyer, banker, and public official, was born in Huntington, West Virginia. In 1914 he became a member of the banking firm of J. P. Morgan and Company, and in 1927 was appointed U. S. Ambassador to Mexico by President Coolidge, a classmate at Amherst. By his hard work and tact Morrow improved relations between Mexico and the United States. Largely through his efforts the vexatious oil issue was settled. Likewise he negotiated the settlement of the controversy between the Calles government and the Roman Catholic church. Col. C. A. Lindbergh, whose goodwill flight to Mexico was sponsored by

Morrow, married the Ambassador's daughter Anne in 1929. After leaving Mexico in 1930, Morrow served as a member of the American mission to the London naval conference. In the election held the same year for U. S. Senator from New Jersey to fill the unexpired term of W. E. Edge and the six-year term, Morrow won decisively, campaigning for repeal of the Eighteenth Amendment. His distinguished public service having made him a possible Republican candidate for the 1932 presidential election, and a likely candidate for 1936, Senator Morrow died suddenly, Oct. 5, 1931.



Samuel F. B. Morse.

**Morse, Edward Sylvester** (1838-1925), American naturalist, born at Portland, Me. He studied science under Agassiz at Harvard in 1859-60, and then became Agassiz's assistant. From 1871 to 1874 he was professor of comparative anatomy and zoology at Bowdoin College, Maine. In 1877 he visited Japan to study the marine fauna, and was professor of zoology in the University of Tokyo until 1880. He was a fine popular lecturer on scientific subjects. His principal works are: *First Book of Zoology* (1875); *Glimpses of China and Chinese Homes* (1902).

**Morse, John Torrey, Jr.** (1840-1937), Am. author and lawyer, was born in Boston.

Mass. Mr. Morse gained distinction as a biographer, writing the lives of *Alexander Hamilton* (1876) and *Oliver Wendell Holmes* (1896), besides editing the 'American Statesmen' series, for which he himself wrote the lives of *John Quincy Adams* (1882), *Thomas Jefferson* (1883), *John Adams* (1884), *Benjamin Franklin* (1889), and *Abraham Lincoln* (1893).

**Morse, Samuel Finley Breese** (1791-1872), American painter and inventor. He was born at Charlestown, Mass. He is one of the best of our earlier American portrait painters, and he was one of the founders and the first president of the National Academy of Design. He was appointed professor of the History of Art at the University of the City of New York in 1835. It was while returning from Europe in 1832, on board the *Sully*, that he conceived the idea of a recording magnetic telegraph. He became engrossed with the idea, and in a little sketch-book, a certified copy of which is now in the National Museum at Washington, he drew diagrams and a system of dots and dashes to represent numerals (afterwards modified by him to represent the letters of the alphabet). The basic idea, quite original and different from any system of telegraphs conceived by others, was there, and only needed elaboration to make it practical. It was not until 1843, and after many discouragements, that Congress voted \$30,000 for an experimental line between Washington and Baltimore, and at last, on May 24, 1844, the first public message was sent over the line, the now historic words, 'What hath God wrought?' It seems not unlikely that the idea of the submarine Atlantic cable originated with Morse; at all events, he laid in New York harbor the first submarine telegraph line (1842). With Prof. John Draper he took the first daguerreotype to be made in this country. See *Prime's Life of S. F. B. Morse* (1875).

**Mortality.** See **Vital Statistics.**

**Mortar**, a mixture used in building to fill the spaces between bricks or stones, consists of about one part by bulk of slaked lime with three of sand along with sufficient water to make a paste.

**Mortar**, a piece of ordnance designed for high-angle fire, the length of which in relation to its calibre places it between a gun and a howitzer. Sea-coast mortars in the United States army are placed in pits, four mortars to a pit and two pits to the battery. For further details see *Artillery, Coast Defense, Guns, Ordnance, and Howitzer*.

**Mortar and Pestle**, an appliance for grinding, or less commonly for mixing, materials. The mortar itself is a bowl of varying shape, in which the pestle, of more or less club shape, is worked by hand.

**Mortgage.** A conveyance of property, real or personal, to secure the performance of an act of obligation. In its strict form the mortgage, involving as it does a transfer of the title to the mortgaged property, is peculiar to English and American law, other legal systems attaining the same result, without divesting the obligated party of his title to the property, by a pledge or hypothecation thereof. Even in our system it is in certain cases possible to create a lien which has the effect of a mortgage on property by an agreement to subject it to the claim of another person. This is known as an equitable mortgage, the title to the property remaining in the mortgager but the mortgagee having a right as against the mortgager or any person claiming under him, excepting an innocent purchaser for value, of satisfying his claim out of the property.

Any person having an alienable interest in property may convey that interest by way of mortgage, either for his own or another's debt, or even to secure the performance of a purely voluntary act; and if property is conveyed for that purpose it is a mortgage even though the conveyance is in form absolute and contains no intimation of its object. This result is attained through the intervention of the courts of equity, which permit a redemption of property which has under common law rules been absolutely vested in the grantee, parole evidence being admitted to show that the object of the conveyance was to secure the performance of an act or obligation. In many of the United States, as well as in England, the mortgagee is still for many purposes regarded as having the legal title to the mortgaged property even before default in the payment of the mortgage debt, and may have the possession of the property, the mortgager, if in possession, being regarded only as a tenant at will under the mortgagee. In all jurisdictions, however, the mortgagee's title even after default is subject to redemption by the mortgager or any one claiming under him, and this 'equity of redemption,' as it is called, is unlimited in point of time and may be exercised until cut off by the process of foreclosure.

In some modern jurisdictions, known as the 'equity states,' the mortgager is for most purposes regarded as the owner of the property, the mortgagee's interest being inaccurately described as a mere lien on the property. Where

this view of the mortgage relation has come to prevail, the mortgager is usually held to be entitled to the possession of the property, at least until default, and, in some states, until his rights are extinguished by foreclosure.

A mortgage is discharged by payment or tender of the mortgage debt. When payment is accepted it is usual for the mortgagee to execute and deliver a written 'satisfaction' of the mortgage. A 'strict foreclosure,' as it is now termed, has the effect of cutting off the mortgager's right of redemption, and thus of making the mortgagee's title to the property absolute. This has in many states been supplanted by a statutory process of foreclosure, by which the land is sold under the direction of the court and the proceeds applied to the payment of the mortgage debt, the balance, if any, being payable to the mortgagor. Many mortgages contain a power of sale authorizing the mortgagee to sell the property in case default is made in the payment of the mortgage debt, and this method of foreclosure, as it is also termed, is now generally regulated by statute. See CHATTEL MORTGAGE; LIEN.

**Mortimer, Roger**, First Earl of March (?1287-1330). The mis-government of the country under Edward II. gave his wife Isabella the excuse for allying herself with Mortimer, and together they invaded England from the Low Countries in 1326. During the minority of Edward III. Mortimer and his royal paramour Isabella ruled the country although there was nominally a council of regency; but in 1330 the young king asserted himself, and had Mortimer put to death.

**Mortlake**, vil., Surrey, England, on Thames. The church, founded in the 14th century, contains the tombs of Phillips, co-actor with Shakespeare, and Sir Philip Francis, the reputed author of the *Letters of Junius*. Tapestry works were established here in the time of James I., and later the place was noted for pottery. Mortlake is the terminus of the Oxford and Cambridge boat-race course; p. 19,000.

**Mortmain**. Alienation in mortmain is an alienation of lands to any corporation, sole or aggregate, ecclesiastical or temporal. However, the term is most commonly applied to describe the perpetual tenure of land by religious corporations, the officers of which under the common law were considered civilly dead. So common were these alienations in mortmain by persons who thought they thereby 'purchased heaven,' that more than half the land of the kingdom is said to have become vested in religious houses, and once vested it could not be

alienated. The need for mortmain statutes has not been felt in the United States generally, and only a few states have passed statutes limiting the power of individuals to convey or devise land for charitable or religious purposes. Pennsylvania, Georgia, and New York have such statutes, but they are not so drastic as the English statutes. Consult Blackstone's *Commentaries*; Pollock and Maitland, *History of the English Law*.

**Morton, Henry** (1836-1902), American scientist, born in New York. In 1869 he was appointed professor of chemistry in the University of Pennsylvania. At the opening of the Stevens Institute, at Hoboken, N. J., in 1870 he was appointed president. He was in charge of the eclipse expedition to Iowa in 1869, and discovered the cause of the phenomena related to the 'bright line' in the solar photographs taken during partial eclipses. He also made important researches on illuminating buoys, fog signals, etc.

**Morton, James Douglas**, Fourth Earl of (d. 1581), regent of Scotland, was the younger son of Sir George Douglas of Pittendreich. On the arrival of Mary Stuart in Scotland he was made a member of the Privy Council, and in 1563 was appointed lord high chancellor. He supported the marriage of his kinsman Darnley to the queen, and headed the armed band who murdered Rizzio. During Moray's regency he was his chief confidant and supporter; and in 1572 he was chosen regent. At a convention held at Stirling (1578) the king was induced to take the government into his own hands. In 1580 Morton was accused of the murder of Darnley, and executed in the Grassmarket, Edinburgh.

**Morton, John** (1724-77), signer of the Declaration of Independence. He was born in Chester co., Pa., was a member of the Pennsylvania Assembly in 1756, and for many years thereafter, being speaker from 1772 to 1775, and was a delegate to the Stamp Act Congress (1765) and to the Continental Congress (1774-1776).

**Morton, John, Cardinal** (?1420-1500), Archbishop of Canterbury, was born near Bere, Dorset. Henry VII. made him primate and chancellor (1486); he was created cardinal (1493).

**Morton, Levi Parsons** (1824-1920), American banker and politician, born at Shoreham, Vt. He was minister to France (1881-85), was Vice-President of the United States (as a Republican) during the presidency of Benjamin Harrison (1889-93), and was governor of New York in 1895-97. The firm of

Levi P. Morton and Company, which he founded in 1863, and which afterwards was known as Morton, Bliss and Company, was dissolved in 1899, and the Morton Trust Company organized in its stead.

**Morton, Oliver Perry** (1823-77), American statesman, born in Wayne co., Ind. In 1860 he was a candidate for lieutenant-governor on the ticket with Henry S. Lane, and when Lane, shortly after his inauguration, resigned to become United States Senator, Morton succeeded him as governor. He threw himself with tremendous energy into the task of raising and equipping troops to preserve the Union; and, despite the bitter opposition of a Democratic legislature, he was able to render services that won for him the distinction of being the greatest of the 'war governors.' He was re-elected governor in 1864, but in 1867, before the completion of his term, resigned to enter the United States Senate. There, he quickly became one of the leaders of his party and one of the most forceful debaters in public life. He was active in carrying through the 'reconstruction' legislation, the 15th amendment, and other important measures, and was a leader in the impeachment proceedings against President Johnston. In return for his services in behalf of the annexation of San Domingo, President Grant offered him the position of minister to England, but he declined it, and he also declined the position of Chief Justice of the Supreme Court. During 1873-76, he endeavored to secure a change in the method of choosing the presidents, and had he succeeded the Hays-Tilden controversy would have been obviated. When that controversy came, he was the leader of that portion of the Republican party which contended that the president of the Senate should count the electoral votes, and was a member of the electoral commission. Consult Foulke, *Life of Oliver P. Morton* (2 vols. 1899).

**Morton, Thomas** (1590-47), Eng. adventurer, born in London. In 1625 he accompanied Wollaston's expedition to New England and during Wollaston's absence seized control of the colony he had founded within the present limits of Quincy, Mass., freed the settlers who had been brought over as servants, and began a successful trade with the Indians. He renamed the settlement 'Merry Mount,' and so shocked the Pilgrims at Plymouth by his conduct that they formed a combination with the other settlements in Mass., and dispatched an expedition under Miles Standish, which attacked Merry Mount, captured Morton and sent him to England (1628). He returned in

1629, but the following year was again deported. He returned to Plymouth in 1643, and in 1644 was once more imprisoned for a year, this time chiefly on account of his book, *New English Canaan*. He died in Maine. Motley made use of his career in his novels, *Morton's Hope* (1839) and *Merry Mount* (1849), as did Hawthorne, in *The Maypole of Merry Mount*.

**Morton, William Thomas Green** (1819-68), American dentist, the discoverer of etherical anæsthesia. He studied medicine in the Harvard Medical School. While studying chemistry in a laboratory under Dr. Charles T. Jackson he was led to investigate the properties of sulphuric ether, and became acquainted with its anæsthetic properties. He satisfied himself as to the safety of its application under proper conditions by numerous experiments upon himself, and on Sept. 30, 1846, he administered it on a patient and painlessly extracted a firmly rooted bicuspid tooth. He then applied for American and European patents for the application of ether in surgical operations, and published the results of his experiments. He succeeded in obtaining patents in the United States and England, and offered his rights without remuneration to all charitable institutions; but the opposition aroused by his patents injured his business to such an extent that he had to retire. The French Academy inquired into his claims as the discoverer of anæsthesia and awarded him and Dr. Jackson jointly the Montyon prize and in 1868 Thomas Lee presented to the city of Boston a monument with the following inscription: 'To commemorate the discovery that the inhaling of ether causes insensibility to pain. First proved to the world at the Massachusetts General Hospital in Boston, October, A.D. MDCCXLVI.' The anæsthetic properties of ether, however, were first studied and demonstrated by an American physician, Dr. Crawford W. Long in Georgia in 1842. Dr. Long failed to induce medical men to use his discovery, and it remained for Morton to succeed in attracting world-wide attention to ether as a powerful anæsthetic for surgical operations.

**Mortuary.** In ecclesiastical law a mortuary is an offering to the church on death, and it appears that formerly a person could not leave his property by will unless he left a sufficient mortuary. This is now obsolete.

**Mosaic,** a surface decoration consisting of variously colored pieces of glass, marble, ceramic, or other similar materials set together to form a pattern or device, and bedded in a mastic or cement ground. Mosaic work is one of the earliest forms of decorative art, and



*Photo by Burton Holmes, from Ewing Galloway, N. Y.*

*Moscow: The Bell Tower of Ivan Veliki.*

though its origin is uncertain, it is believed to have been first used by the Egyptians, and subsequently adopted for floor and mural decoration by the Greeks and the Romans. It was extensively used by the Byzantine artists, who reintroduced it into Italy, where it continued to be practised until late in the middle ages. Consult Barwell and Druitt's *Mosaics and Stained Glass*.

**Mosaic Disease**, a disease of the tobacco plant. See TOBACCO.

**Mosaic Gold**, a fine flaky form of tin disulphide used in the arts to imitate bronze.

**Mosasauros**, a genus of large extinct rep-

tiles, which had long, attenuated bodies, powerful jaws, and limbs adapted for swimming.

**Mosaylima**, or **Moseilema**, a rival of Mohammed. He proposed to divide with the latter the title and authority of 'Prophet of God,' and after Mohammed's death declared that he had been made the Prophet's successor. He was defeated and slain by Khalid, general of the true caliph, Abu Bekr (632).

**Mosby, John Singleton** (1833-1916), American soldier in the Confederate service, was born in Edgemont, Va. His best known exploits are the capture (1863) of General



Stoughton at Fairfax Courthouse, inside the Federal lines; the capture of Sheridan's supply train at Berryville in August 1864; the destruction of a portion of the Baltimore and Ohio Railroad later in that year, and the capture of Brigadier-General Duffié. He was assistant attorney in the U. S. Department of Justice from 1904 to 1910. He published *War Reminiscences* (1887) and *Stuart's Cavalry in the Gettysburg Campaign* (1911).

**Moscow**, second largest city of Russia, capital of the Soviet government, is situated mainly on the n. bank of the Moskva. It is the see of the metropolitan of Moscow and the chief railway and industrial center of the country. The city is divided into five main parts, separated from each other by walls and forming a series of concentric circles, of which the Kremlin is the center. The Kremlin, the oldest part of the city, is an irregular triangle enclosed by a battlemented brick wall, 65 ft. in height, and pierced by five gates. Within this wall are the Great Palace, erected in 138-49; the Cathedral of the Assumption, where the Czars were formerly crowned, and other important buildings. In front of the bell-tower of Ivan Veliki, on a granite pedestal, is the Tsar Bell, the largest bell in the world, weighing 198 tons and adorned with inscriptions and reliefs. It was cast in 1733, was later broken and for a century lay embedded in the ground until it was raised and placed in its present position.

North of the Kremlin is the Inner City, between which and the Kremlin lies the Red Square with the Cathedral of St. Basil. Moscow is important as a commercial and manufacturing center.

The first mention of Moscow occurs in 1147, when it was the estate of Prince Dolgoruki. In 1237 it was burned by the Mongols. Ivan the Great made it the capital of Russia and a period of growth and prosperity ensued. On Sept. 14, 1812, Moscow was occupied by the army of Napoleon; the following day it was burned by the inhabitants and the French army was forced to withdraw in the famous 'retreat from Moscow.' Revolutionary disturbances occurred here in 1905-6 and the city was a center of activity in the Revolution of 1917. It became the capital of Soviet Russia in 1918; p. 4,137,000.

**Moscow Conference.** See UNITED STATES, UNITED NATIONS CONFERENCES.

**Moselle**, or **Mosel**, a tributary of the Rhine, rising on the western slopes of the Vosges Mountains. Its slopes, especially in the lower course, are terraced with vineyards,

which produce the famous Moselle wines. There are numerous historic ruins on its banks. The total length is 314 m.

**Moses**, the brother of Aaron and Miriam, and the founder and first legislator of the Israelite nation. The story of his birth and infancy is one of the treasured gems of Hebrew literature. The infant was placed in an ark on the Nile, was found and adopted by the daughter of Pharaoh, and was brought up as an Egyptian prince. But his heart was with his enslaved brethren, and his slaying of one of their oppressors necessitated his flight to Midian, where he received a divine call to be the deliverer of his people from Egypt. After considerable trouble he led them forth, crossed the Red Sea, in which the pursuing Egyptians were drowned, and then, during a 40 years' residence in the desert, organized the religious and social polity of the nation.

**Mosley, Sir Oswald Ernald** (1896- ), English political leader, was educated at Winchester. In 1922 he became an independent member of the Labor Party; 1931 he formed the New Party; became leader of British Fascists; jailed by British government (1940-1945).

**Mosler, Henry** (1841-1920), American genre painter, was born in New York City, and was a pupil of J. H. Beard. In 1879 the French government bought his 'Return of the Prodigal Son' for the Luxembourg Gallery, this being the first American picture bought by France. The Metropolitan Museum of New York has one of his largest pictures, 'A Wedding Feast in Brittany.'

**Mosque**, a Mohammedan house of worship. They vary greatly in size and magnificence from a single white-washed room to the elaborate structures of the Moslem capitals. The latter generally have connected with them a large paved square on a raised plinth surrounded by high and massive walls. The center is unroofed, and open colonnades run along the four sides. Characteristic features of these buildings are the dome, or domes, of Saracenic design, and the minarets. In the centre of the open quadrangle is a tank of water for ablutions. Shoes are always removed before entering. See MOHAMMEDANISM.

**Mosquitoes.** The true mosquitoes are small flies of the order Diptera, and from the family Culicidæ. The insects of this family have the following distinguishing characteristics. They possess long, slender antennæ, composed of 14 or 15 joints; a greatly elongated, slender proboscis; the wing veins are clothed with minute scales, and there are 10 veins or sub-

divisions of veins which reach the margin of the wings. There is no distal cell in the wings, and there are spurs at the apex on the inner side of the tibiae. Down to the year 1900 mosquitoes of the world were not well known, and comparatively few species had been described by entomologists, but the discovery that the species of the genus *Anopheles* and allied genera are responsible for the transfer of malaria, and the subsequent discovery that *Stegomyia calopus* is the sole transmitter of yellow fever, have attracted widespread attention to the group, and very many new species and new genera have been collected and described. Several hundred species are now known, and these are distributed among many genera and several subfamilies.

Mosquitoes are found in almost every locality where there is opportunity for them to breed, and this opportunity depends simply upon the presence at some time during the year of standing water. They abound in the tropics, and a greater variety of forms are found in that region than in the temperate zone, but they occur in great numbers, though in less variety, far to the north, the inhabitants of Alaska and Kamchatka suffering from their attacks during the short far-northern summers. The most abundant mosquitoes belong to the old Linnæan genus *Culex*. Perhaps the commonest of the species of *Culex* is the abundant and cosmopolitan rain-water-barrel mosquito, *Culex pipiens* L. This species occurs apparently all over the world, is a severe biter, and a very rapid breeder.

The female of this species lays her eggs in a raft-shaped mass on the surface of standing water, each mass or batch containing from 200 to 400 eggs. The young larvæ, or wrigglers, as they are commonly termed, issue from the under side of the egg-masses, and are extremely active at birth and subsequently.

In the height of summer the eggs hatch in from 16 to 24 hours, the larvæ reach full growth in about 7 days, and then transform to pupæ, in which stage they remain two or three days before the adult insect emerges.

The commonest American species of *Anopheles* is *A. maculipennis*, and this species is also distributed rather widely in other sections of the world, being one of the commonest forms in South Europe. Its eggs are not laid in a raft-shaped mass, but occur singly on the surface of the water, where they rest on their sides. They are not attached together except that they naturally float close to each other, and there are 40 to 100 eggs in each laying. The eggs hatch in from three to five days,

and the resulting larva or wriggler differs markedly in its appearance and in its habits from the larva of *Culex pipiens*.

There are many generations each summer of both *Culex pipiens* and *Anopheles maculipennis*, and both species hibernate as adults in the cellars of houses, in barns and other out-houses, and in sheltered places, such as under the loose bark of trees, under bridges, and even in the cracks of fences.

The yellow fever mosquito (*Stegomyia calopus*, often referred to as *Stegomyia fasciato*) is a species of tropical and subtropical distribution, its range extending from 38° n. lat. to 38 s. lat., but in this area its habitat is confined to low-lying regions and naturally to well-watered regions. It is a domestic mosquito, and does not breed in the swamps or away from civilization. It is found in every accumulation of water about the house and breeds rapidly. This species is now accepted as the only means by which yellow fever is transmitted from sick persons to non-immunes, and measures directed against this mosquito only have resulted in the arresting of yellow-fever epidemics.

The main remedies against mosquitoes must be directed against their breeding-places, and the most successful of these remedies are three in number: the total abolition of breeding places; the treating with petroleum of the surfaces of stagnant pools which for some reason cannot be drained; the introduction of fish into fishless ponds.

**Mosquitos**, natives of the Mosquito Coast on the e. (Atlantic) side of Nicaragua, and in the e. corner of Honduras in Central America. They are a very mixed people, the chief constituent elements being the local Indian, the Carib Indian from the W. Indies, and the Negro, mainly from Jamaica, with a strain of white blood dating from the days of the buccaneers. All speak colonial English. It was the footing claimed by England in Central America through the Mosquito protectorate that aroused the jealousy of the United States and brought about the Clayton-Bulwer Treaty of 1850. Their status was defined in 1905 by a treaty by which they recognized the sovereignty of Nicaragua.

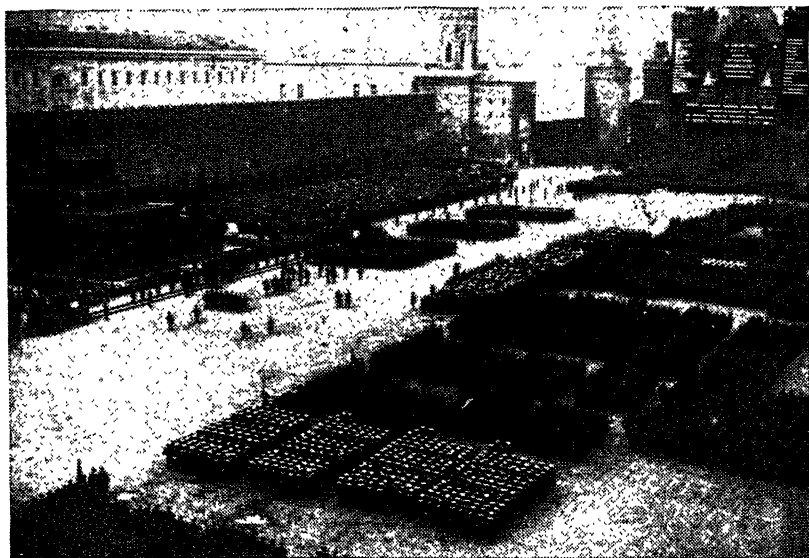
**Mossel Bay**, seapt. (free port), Cape Colony, formerly Aliwal South. The harbor has from 3½ to 7 fathoms of water; p. 10,698.

**Mosses**, a term often used with the same meaning as Bryophyta, which includes the liverworts (Hepaticæ), as well as the true mosses (Musci), but more generally is confined to the latter. In dry weather the spread-

ing beds of moss give out the water they have sucked up during heavy rains, thus acting as natural sources of irrigation. Four orders of mosses are usually reckoned: (1.) Bryinæ. Here belong most of the true mosses. It has two main divisions—Acrocarpæ, in which the female organs and spore-cases are terminal on the main axis; and Pleurocarpæ, in which they are borne on lateral branches. To the first belong *Mniūm*, *Polytrichum*, and *Funaria*; *Hypnum* and *Fontinalis* are examples of the latter. (2.) *Phascaceæ*, with terminal capsule, by the decay of which the spores are set

**Most Favored Nation Clause** is a term most frequently used in connection with the tariff arrangements between nations, but often applied to all commercial arrangements between them. It means generally that the two contracting nations bind themselves to treat each other more favorably than other nations, who have made no specific contract. This treatment may be limited to certain spheres, such as the tariff.

**Mosul**, formerly capital of the Turkish vilayet of Mosul, now town of Iraq, on the Tigris River, opposite the mounds of ancient



*May Day Parade, Red Square, Moscow.*

free. (3.) *Andreaeæ*, in which the capsule opens longitudinally, the valves remaining united at the apex and base. (4.) *Sphagnaceæ*, with a spherical capsule containing a hemispherical spore-sac. See Bennett and Murray's *Cryptogamic Botany* (1889), Campbell's *Mosses and Ferns* (1895).

**Mostaganem**, fortified seaport, department Oran, Algeria. The city is the site of an ancient Roman town; it was an important trade center in the 16th century; and it has enjoyed renewed prosperity since the French occupation (1833); p. 26,500.

**Mostar**, town in Yugoslavia, on the Neretva. It is the residence of a Greek and a Roman Catholic bishop, and has a fine Greek Cathedral. Wine is produced, and swords and tobacco manufactured; p. 18,176.

Nineveh; 220 m. up the river from Bagdad. It is partly surrounded by crumbling walls, and the Great Mosque is the only remaining ancient building of interest.

Mosul was an ancient town of the Arabs, who lost it to the Moslems in 636. It suffered a siege by Saladin in 1182; was in the hands of the Mongols and the Persians; and was finally joined to Turkey in 1638. The town was long a great trading center, noted particularly for its manufactures of muslin, to which it gave its name. Its importance has greatly declined since the opening of the Suez Canal and the rise of Bushire. During World War I Mosul was the objective of both the British and Russian forces campaigning against Turkey and was finally entered by the British a few days before the Armistice; p. 100,000.

**Moszkowski, Moritz** (1854-1925), Polish composer and pianist, was born in Breslau. His fame as a composer rests chiefly upon his dainty salon compositions for the piano. These include two books of *Spanish Dances*, a tarantella, humoresque, and numerous concert studies.

**Motet**, a form of sacred choral composition of moderate length, set to Latin words, and from about the 14th century frequently used to supplement the service of high mass.

do counties. It is the source of much of the gold output of California. The name is also given to an important metalliferous vein in Mexico. See **LODES**.

**Mother-of-Pearl**, or **Nacre**, the hard, iridescent lining of the shells of pearl-bearing molluscs. It is composed of a number of extremely thin, translucent films secreted by the oyster, and consists of an organic substance, called *conchiolin*, combined with calcareous matter. Mother-of-pearl is used for making



*The Pearl Mosque, Delhi.*

**Mother Carey's Chicken.** See **PETREL**.

**Mother Goose**, the reputed author of a volume of nursery jingles published in Boston in 1719, and known as *Mother Goose's Melodies*. The name seems to have originated in France, where Charles Perrault, in 1697, published his *Contes de Ma Mère l'Oye* ('Tales of Mother Goose'). This contained none of the rhymes of the American publication, however.

**Mother Lode**, a corrupt translation of the Mexican *veta madre*, is the popular term for the Great Quartz Vein of California, stretching for 100 m. n.e. and s.w. through Mariposa, Tuolumne, Calaveras, Amador, and El Dorado

buttons, knife handles, and jewelry, and for inlaying furniture, musical instruments, and lacquer work. See **PEARL**.

**Mother's Day**, the second Sunday in May, has been set apart for special observance in honor of the home and motherhood. The object of the day is to recall memories of the mothers who have gone; to brighten the lives of those who remain; and to encourage men, women, and children to honor home and parents. The idea of Mother's Day originated with Miss Anna Jarvis of Philadelphia. In 1914, Congress authorized the President of the United States to designate, by annual procla-

mation, the second Sunday in May as Mother's Day. The first national proclamation was issued by President Wilson on May 9, 1914.

**Mothers' Pensions.** Payments to mothers, commonly known as 'mothers' pensions,' are grants of money from a public treasury for the care, by the mother, of one or more dependent children toward whose support the father, either because of death or other reasons, does not contribute. The general establishment of mothers' pensions in the United States has doubtless been due in large measure to the raising of the minimum age limit as applied to child labor.

The legislation in New York State in 1915 was of particular interest because of the wide discussion of the subject following the issuance of the report of a special commission which had thoroughly investigated the matter. The law finally enacted provided for the administration of the system by 'Local Boards of Child Welfare' under State supervision, a plan similar to that adopted in Massachusetts in 1913, in which State the local overseers of the poor act as dispensers of the aid under the supervision of the State board of charity. See NATIONAL INSURANCE.

**Motherwort**, (*Leonurus cardiaca*), a plant of the order Labiatae, found about hedges and in waste places in Europe, and abundantly naturalized in some parts of North America.

**Moth Fly**, any member of the family Psychodidae, with broad wings, and body and wings covered with fine hairs. They live in running water, on leaves in pools, and in dried manure. About twenty varieties are known in the United States.

**Moths**, or **Heterocera**, a division of the Lepidoptera order of insects, including all species not classed as Rhopalocera, or Butterflies. They form a distinctly heterogeneous series, but in general may be said to differ from the butterflies in the form of the antennae, the shape of the body, the position of the wings when at rest, and the time of flight. The antennae, which furnish the most distinguishing feature, are neither blunt nor knobbed, as in the butterfly, but are threadlike and tapering, and often elaborately feathered. The body is heavy, as a rule, and the wings are usually held horizontal or folded roof-like over the abdomen while the insect is at rest. Most varieties of moth fly at night, though some tropical species are diurnal in habit. Practically all varieties, except the silk producers, are directly injurious to man's interests in the larval stage, attacking growing crops, shade and fruit trees, grain, honey,

woolen goods, feathers, and other raw and manufactured materials. (See INSECTS; BUTTERFLIES; CATERPILLARS; LEPIDOPTERA; CODLING MOTH; EGGER MOTHS; GYPSY MOTH; LUNA MOTH.)

Consult W. J. Holland's *The Moth Book*; M. C. Dickerson's *Moths and Butterflies*; W. C. O'Kane's *Injurious Insects* (1912).

**Motif**, in a musical composition, means the principal subject on which the movement is constructed, and which, during the movement, is constantly appearing in one or other of the parts, either complete or modified. Wagner made almost constant use of the *leit-motif* ('guiding theme') in his music dramas. See LEIT-MOTIF; WAGNER, WILHELM RICHARD.

**Motion**, as a legal term, signifies an application to a judge at chambers or to a court in a case which is proceeding, in order to obtain an order or rule directing some act to be done.

**Motion in Plants.** See *Plants, Movement*; **Insectivorous Plants.** For animal locomotion, see *Flight*.

**Motion, Laws of.** Newton bases his great work, the *Principia*, on three laws of motion, which are statements, partly by way of definition, partly by way of postulate, of fundamental dynamic conceptions. The first law asserts that every body left to itself, free from the action of other bodies, will, if at rest, remain at rest, or will continue to move with constant velocity. It is usual to regard the first law as a definition of the property of *inertia*. The second law states that the rate of change of the *momentum* of a body measures in direction and magnitude the force acting on it. To get into touch again with the universe, we need the third law, which states that to every action there is an equal and opposite reaction. See DYNAMICS; FORCE; NEWTON; PERPETUAL MOTION.

**Motion Pictures.** See *Moving Pictures*.

**Motive** means, in general, what moves to action or appeals to the will. It is used to designate the end or object aimed at in the action; and the feeling or emotion which prompts the agent to seek the end. See ETHICS.

**Motley, John Lothrop** (1814-77), American historian, was born in Dorchester, Mass. In 1841 he went to St. Petersburg as secretary of legation; but he disliked the post and the place, and soon resigned. On his return he wrote several articles for the reviews, and another historical novel, *Merry Mount, a Romance of the Massachusetts Colony* (1849). In 1849 Motley served a term in the Massa-

chusetts legislature; and by that time he was hard at work on what was to prove his first great literary triumph. Fully ten years in all were spent on his *History of the Dutch Republic* (1856).

After a short stay in the United States, Motley returned to Europe to write the continuation of his *Dutch Republic*, which was published as *The History of the United Netherlands*, the first part in 1860, the second in 1868. In 1861-7 he was U. S. Minister to Austria, and in 1869-70 Minister to Great Britain, being summarily recalled as a result of a feud between President Grant and Senator Sumner. His letters to the London *Times* on the Civil War were valuable efforts to enlighten the British public on the issues involved. His last work was *The Life and Death of John Barneveldt* (1874), a biography which is virtually a continuation of his history of the Dutch. He died at Dorchester, England, May 29, 1877. Consult the *Memoir* by O. W. Holmes; his *Correspondence*, edited by G. W. Curtis.

**Motmot**, a momotoid bird of the warmer parts of America, related to the kingfishers, having feathers with after shafts and mandibles with serrated edges.

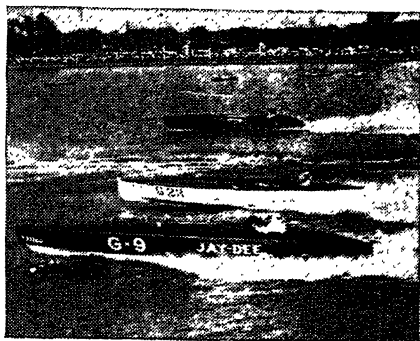
**Moton, Robert Russa** (1867-1940), educator, was born in Amelia co., Va. He succeeded Booker T. Washington as principal of Tuskegee Institute, 1915. His works include *Finding a Way Out* (1920), *What a Negro Thinks* (1930).

**Motor Boats** are now generally understood to be boats propelled by gasoline or other internal-combustion engines. The gasoline engine was first introduced for the propulsion of boats in the late '80s, at the time of its early use in automobiles. A motor boat with a Daimler gasoline engine was shown at the Paris Exposition of 1889. On account of its convenience, the small space required for an engine of given power, and the superior speed available, the gasoline motor boat has largely superseded the steam launch, naphtha launch, and electric launch. Motor boats may be divided into three main classes—Cruising Boats, Speed Boats, and Racing Boats—among which, however, there is no sharp demarcation.

Since 1910 entirely new shapes or *step* of hull, known as the *hydroplane* and the *V-bottom*, have come into general use for racing and speed boats. These new shapes enable the boats to raise themselves and move partly on the surface of the water, instead of through it, at high speeds; this action is

called 'planing.' For a description of the gasoline engines used in motor boats, see the article OIL AND GASOLINE ENGINES. Propellers for motor boats are made with two, three, or four blades. In the usual form of propellers, the blades project radially from the shaft.

Outboard motors are growing both in favor and reliability. Beginning with single cylin-



*Motor Boat Race for President's Cup, Potomac River.*

der engines they soon used the two-cylinder opposed type both on account of power and balance. These still predominate although four-cylinder engines for outboard use are now available. These motors are easily clamped to the stern of row boats and both drive and steer, the tiller turning the propeller with reference to the center line of the boat, and so manœvering the boat as desired. Outboard motors have added much to the popularity of boating in quiet waters. They are not considered so desirable in large bodies of water.

The first international outboard races ever held in the U. S. took place at Palm Beach, Florida, March, 1934. Antonio Becchi, Italian, using an Isotta-Fraschini motor won over three Americans. He averaged 54 m. an hour. In 1939, Sir Malcolm Campbell established world record motorboat mile of 141.74 miles per hour.

**Motor Cars.** Any mechanically propelled vehicle carrying its own propulsive machinery may be called a motor car. Here, however, under this heading will be treated only motor cars for use like horse-drawn carriages on ordinary roads and streets. Traction engines are considered in a separate article under that head. Motor cars used on railways are described under ELECTRIC TRACTION and STREET RAILWAYS.

The motor cars in use to-day are entirely driven by internal combustion engines except for a few trucks and delivery vehicles used in city transportation. The first vehicles used steam but this type had practically disappeared by 1920. The first motor vehicle was built by a Frenchman, Cugnot, in 1770. It was a small three-wheeled wagon which carried two people at the rate of  $2\frac{1}{4}$  m. an hour. Like all the early motor cars, it was propelled by a small steam engine, taking steam from a plain drum boiler fired with coal or wood.

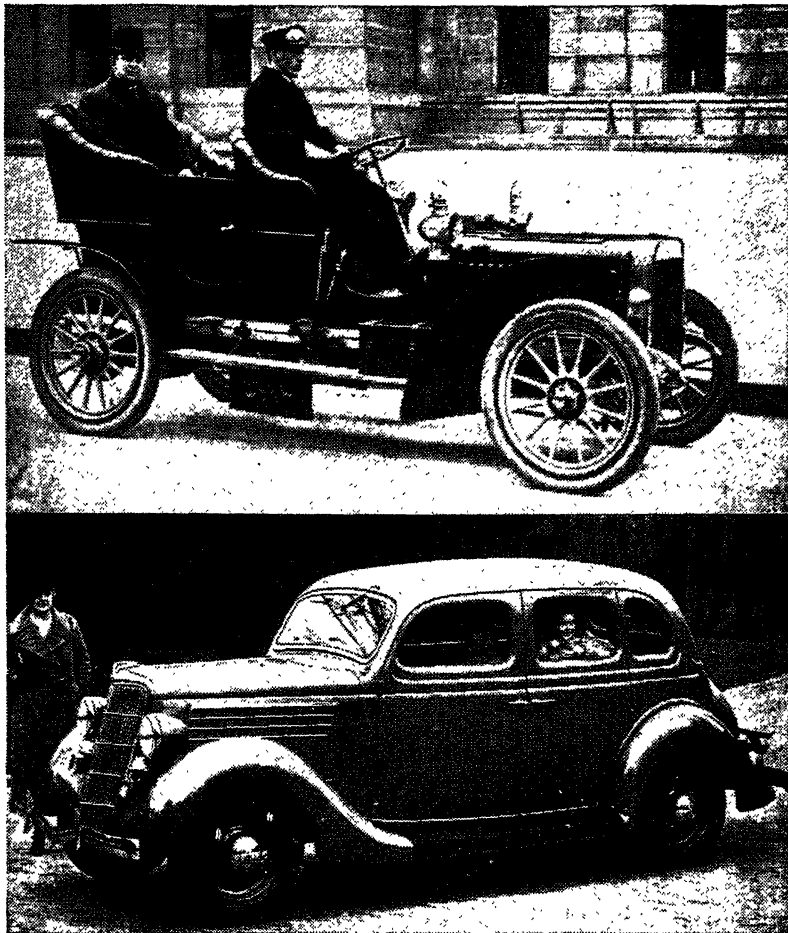
The electric motor car was first experimented with on a practical scale in the 90's, and for a few years was developed side by side with the gasoline car, although never its rival except in a comparatively limited class of service. It has now disappeared except for a limited number of trucks. The advantages of the gasoline engine over steam and electricity lie in its small weight per horsepower, the facility with which new fuel supply can be obtained, and the small amount of attention required for its care and operation. In the United States, the *fuel* used is generally termed gasoline, but in Great Britain it goes by the names of motor spirit, petroleum spirit, and petrol (see PETROLEUM). Various attempts have been made to utilize other fuels in internal-combustion engines. Acetylene, naphthalene, ether, alcohol, and kerosene have been tried; but only the last two have met with any considerable success. The use of benzol, aniline, and other ingredients in gasoline is growing, and what are known as 'doped' fuels are being advocated to permit a higher compression in the engine. Ethyl-lead mixtures are quite successful, and while not originally favored on account of the poison hazards in preparing and handling, are now being rather widely used.

In the gasoline engine the fuel is first vaporized by spraying it into a current of air. This is accomplished in the *carbureter*. The mixture of gasoline and air is then admitted to the engine cylinder, and compressed to about 90 lbs. per square inch above atmospheric pressure in the later engines. An electric spark is then discharged through the spark plug, which is fixed in the cylinder at one end in such a position as to be surrounded by the compressed mixture. The spark ignites the mixture, which explodes or burns very rapidly. The explosion produces a pressure of 500 to 600 lbs. per square inch in the cylinder, and the expansive force of the explosion is used to drive the piston—just as the expansive force of gunpowder is

used to drive a bullet from a gun. Where detonation occurs the pressure sometimes runs as high as 1,100 lbs. per square inch.

On motor cars the four-cycle engine is universal at present, the two-cycle engine having disappeared from the automobile field. See OIL AND GASOLINE ENGINE. The modern motor car has been made possible only by the improvements of recent years in metallurgy and machine shop practice. Engine cylinders are allowed to vary less than one-thousandth of an inch from the true diameter. They are usually made of cast iron, late practice including the use of nickel alloy castings to present a hard wearing surface to the piston. In some few cases cylinder blocks of aluminum are fitted with cast iron or steel liners. The piston is of cast iron, aluminum or magnesium alloy. The piston is made a few thousandths of an inch smaller than the cylinder in diameter, and has two or more grooves for piston rings. The rings are of cast iron, cut through at one point so that they can be spread apart and slipped over the end of the piston and into the ring grooves. When in place they spring out against the cylinder walls and make the piston gas-tight. Crank shafts, cam shafts, and connecting rods are made of steel forgings. Special alloy steels are commonly used. The first gasoline cars had one-cylinder engines, but these were soon superseded by two- and four-cylinder models. In 1915-16 a number of eight-cylinder models were brought out, and several twelve-cylinder models. One car has brought out a 16-cylinder V-type engine. The eight-in-line, or straight-line eight, is being built in increasing numbers. The object in increasing the number of cylinders is to secure a more nearly continuous flow of power—i.e., a more nearly constant torque. Against the gain in this direction, however, must be weighed the increased complication and the increased number of wearing parts.

Two types of friction clutch, the cone and the disc, were formerly in favor, but the cone clutch has given way to the disc. The disc clutch is made either with one disc (the 'single-disc' clutch) or with several (the 'multiple-disc' clutch). It is sometimes run in oil, but more frequently dry. One set of disc is usually faced with a special frictional material. The clutch is mounted close to the fly-wheel, some part of which often constitutes one member of the clutch. The other member is fixed on one end of the shaft leading to the transmission gearing. The function of this gearing is to permit of a variety



*Motor Cars: Upper, Early Model; Lower, Recent Type.*

of speed ratios between the engine shaft and the driving wheels. On the great majority of American cars gears are provided for three different speed ratios, but a number now have four different speeds. The number of speed ratios in a transmission has no direct bearing on the speed of a car in miles per hour. It simply means that there are two, three, or four car speeds at which maximum engine power can be secured. Since the gasoline engine cannot conveniently be reversed, the transmission must include gears for driving the car backward. The reverse gear usually gives the slowest speed at the wheels relative to the engine speed, and consequently the highest torque.

The earliest gasoline motor cars had leather

belt, and pulley transmissions. Different-sized pulleys gave the different speed ratios, and the reverse was obtained through a crossed belt. This was followed by chain drive and reverse gears. The transmission now in most general use is of the sliding-gear type. Other types of change-speed gearing are used to some extent. Much experimenting has been done with friction gears and discs, which are very alluring for the reason that they will give any desired speed ratio within their extreme limits. They are now seldom used in the United States, however. The planetary transmission was formerly very largely used on low-powered cars—usually for not more than two speeds and reverse. In this type of transmission the gears are always in mesh,



and are enclosed in a cylindrical case made up of two or more separate rings or bands. A somewhat recent development is the front wheel drive in which the transmission and differential are at the front of the engine and drive the front wheels through universal joints.

The rear axle, as arranged for the shaft drive, is made in two distinct types, live and floating. The wheel in the live axle is keyed directly to its outer end, which runs in a bearing in the tubular housing next to the wheel. The live axle carries the weight of the car at the point of bearing. With a floating axle, the wheel runs on the outside of the axle housing and this carries the load. The axle floats inside the housing, driving the wheel by a suitable connection at the outer end of the hub.

The *differential gear* is a device for transmitting power from the drive shaft to both halves of the axle at all times, regardless of whether they are turning at the same speed or not. Without the divided axle and differential, one wheel or the other would continually be slipping. In the early days of the motor car industry in America, most of the builders had formerly been bicycle makers, and the natural result is seen in the tubular frames, wire-spoke wheels, ball bearings, and pneumatic tires of the earlier cars. The pneumatic tire has remained; it seems to be an essential of passenger cars and is used on many motor trucks. A great improvement now in almost universal use is the demountable rim. Complete spare wheels with air-filled tires are frequently carried, and the wheels are changed instead of the rims. The drop center rim is also being used in large numbers. The balloon tire has been adopted by nearly all makers, and few new cars have tires smaller than 4.40 in., while the larger sizes run up to 7.70 in. The size is not the only difference, however, as the balloon tires are built with more flexible walls, to run with pressures from 20 to 35 lbs total. Truck tires remain about as before, both as to pneumatic and solid, with a noticeable increase in the use of large pneumatic tires. The tire made of fabric has very largely given way to those built up of cords, this being especially true of balloon tires. The inflation pressure for balloon, or low-pressure, tires varies from 5 to 8 lbs. per square inch. The best pressure, however, depends on the load on the tire and the amount which this load flattens the tire on the ground. The balloon tire runs with a much greater ground area than the old

tires and consequently is less apt to skid or slip. It also turns harder at slow speeds, especially in parking.

The front axle is either a steel forging of 'I' section or, less often, a thick-walled steel tube, and is usually bent down in the middle where it passes under the engine. The short shafts or spindles on which the front wheels revolve are connected to yokes on the ends of the axle by knuckle joints, so that only these spindles are turned in steering the car. Each spindle has a horizontal arm projecting from it, by means of which it is turned. The two arms are connected by a rod which causes the wheels to turn in unison. This connecting rod is placed sometimes in front of, and sometimes behind the axle. An additional arm projects from one of the knuckles, and is connected to the mechanism at the foot of the steering post by which the car is steered. Many different types of steering gear are in use, but the worm-and-sector gear predominates. Besides the steering wheel, the steering post carries the throttle and spark levers, which control the speed of the engine. The time in the stroke at which the spark occurs can be varied by shifting the contact maker. The earlier the spark occurs, up to the point where it would cause the explosion so soon as to make it check the up stroke of the piston, the greater will be the power and speed of the engine. Since some small interval of time is required for the explosion—that is, for all the gas in the combustion space of the cylinder to be ignited—the best time for the spark is when the engine crank is within a few degrees of having reached its upper 'dead center.' The speed may also be changed by varying the quantity or quality of the mixture admitted to the cylinder. The quantity is regulated by the throttle lever through a butterfly valve at the carbureter. The quality is controlled by a needle valve, either at the carbureter or operated from the dash. All American cars are now being built with brakes on all four wheels. Hydraulic brakes are frequently used in this manner. The maximum gripping power is made sufficient to lock the wheels on any ordinary road surface. Air brakes are in use on buses to some extent. The engine itself can be used as an effective brake on descending hills by keeping the clutch engaged, with the ignition cut off or retarded. Motor car frames are now made of pressed steel of channel section. The frame is often narrowed between the front wheels, or tapered from the rear, to permit a smaller turning radius,

and raised over the rear axle to make room for the springs, while keeping down the floor of the car and the center of gravity. The French word *chassis*, meaning literally 'frame,' is commonly used in America to designate the complete frame, running gear, engine, and transmission—practically the entire car except the body and hood. Shock absorbers, that tend to check the rebound, are standard equipment on many cars.

The bodies of motor cars are made in greater variety of styles than the engines and running gears. The *limousine* is a popular closed-body style for chauffeur-driven high-powered cars carrying from five to seven passengers. In this style, the rear seat or seats are separated from the driver's seat, which is protected by an extension of the roof. A large plate of glass, termed a wind shield, protects the forward opening without obstructing the view ahead. The *town car* is like the limousine, except that the roof is not extended over the driver's seat. 'Fore doors' enclosing the front seat were first generally introduced in 1910. The limousine with driver's seat enclosed was formerly called a *berline* but is now known as a suburban sedan or limousine. The *landaulet* resembles the limousine, except that the rear portion of the top and sides is made collapsible, so that it can be folded back to expose the rear seat. The *sedan* is an enclosed car seating four or more, including the driver, all in one compartment. The *brougham* is a close-coupled sedan, differing from a *coupé* in that it has two seats instead of one. In the *touring car*, or *phaeton* as it is now called, the top is not a part of the body itself, although a canopy top which can be raised or lowered is provided as a protection from the weather. Side curtains are used in cold or stormy weather. A rumble seat for a third person is sometimes applied to two-passenger cars, behind the fixed seat. The two-passenger cars of comparatively low power, for use mainly in short runs on city streets, are called *runabouts*; while a sturdier and somewhat higher-powered type for touring is called a *roadster* or *sportster*. The *coupé* which normally seats two, and also made to seat three or four passengers in a closed body, is growing rapidly in favor. The fourth seat is usually an auxiliary which can be folded out of the way when not in use. This type of body is frequently known as a *Victoria*. A two-door sedan, known as a *coach*, or two-door, is also popular.

Motor Trucks for freight and package de-

livery and many other strictly utilitarian purposes have come into general use. They offer a more rapid and often a more economical means of transportation than the horse-drawn truck. The question of the economical use of the motor truck for delivery or haulage of any kind is largely one of keeping the truck moving. The arrangement of the chassis of the gasoline truck is similar to that of the touring car. The engine and radiator are mounted at the front end of the frame. The engine is connected through a clutch with the transmission gearing, located usually close to the engine (unit power plant construction). A sliding-gear transmission, giving three speeds forward and one reverse, is commonly used on trucks of all sizes, although some trucks of one ton or under have only two forward speeds. Within the last few years the carrying capacity of trucks has been greatly increased by the use of trailers. Trailers are made in two common types. Probably the most common type is one which uses the truck chassis for its front support and is supported in the rear by a third set of wheels. This is known as a semi-trailer. Many trailers, however, are simply four-wheeled trucks without power which are pulled behind a loaded truck by the use of a bar, which causes its front wheels to steer in order to follow the truck which is pulling it.

Motor trucks for farm use are arranged for alternately carrying produce to market and for acting as portable power plants to drive rotary saws, corn shellers, and other farm machinery. Wheels with special rims and treads are provided, which enable the motor trucks to run over fields and haul harrows, hayrakes, and other agricultural implements when not needed for trips to town. (See TRACTORS.) The Great War of Europe demonstrated most strikingly the important part that can be played by the motor truck in solving modern transportation problems; and the motor truck contributed one of the important factors to distinguish this war from any which have preceded it. The immense supplies of food and ammunition probably could not have been maintained without the motor truck's help. Used as a means of transporting men, the motor truck brought up reserves with a celerity which reduced the advantage of an attack at an unexpected point. Light artillery was carried or towed by motor truck from one place of action to another in less than half the time possible with horses. Toward the end of the war mo-

tor-driven gun mounts, carrying as high as 6-inch guns were used in some cases. Armored cars, protected by steel plates from rifle fire, and carrying one or two machine guns mounted in turrets, have been found effective for scouting and minor offensive opera-

cabs and omnibuses are used extensively in cities and towns for public passenger service. The passenger car chassis was the original basis for the taxicab, but the modern taxicab has a chassis designed especially for the service it renders. It combines sturdiness,



*Motor Truck, Recent Type.*

tions. Tanks, which are armored bodies on a caterpillar or crawler type chassis, have been developed in various sizes, capable of being driven over rough country, pushing down small trees and surmounting earthworks and shell holes. (See TANKS.)

short turning radius, small wheels, and other special features. Special bodies are fitted on  $\frac{3}{4}$ -ton to 3-ton trucks to make the larger buses carrying a dozen or more passengers and the sight-seeing cars, much used in large cities, with seats for 20 to 40 passengers.



*Motor Bus, Super Coach.*

Several novel features in construction and mechanism have recently been added. The chassis and body are less conventional. Independent wheel suspension is utilized. The automatic clutch is being tried out. The Graham supercharger employs an engine driven blower for air and gas. Gasoline taxi-

Some special buses now even have sleeping compartments. Motor ambulances and patrol wagons are now common in cities of any size. Motor fire apparatus has won its way up from the experimental stages into general favor since 1910; and motor-driven apparatus is now furnished to replace all

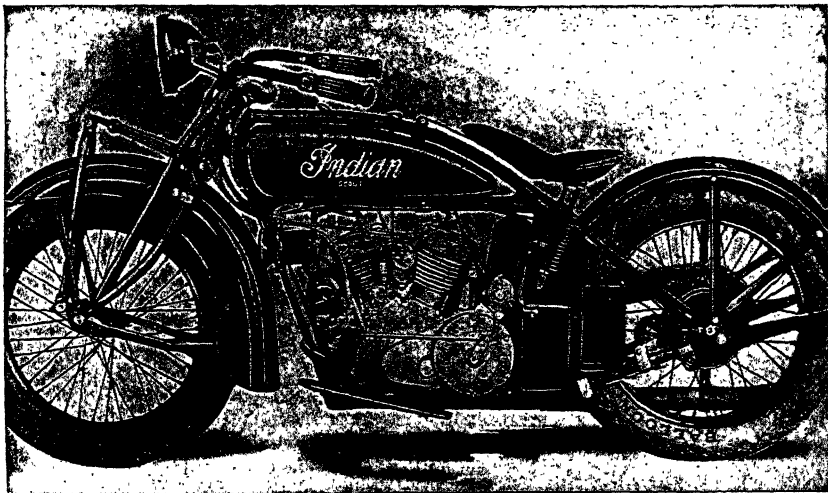
forms of horse-drawn fire-fighting equipment. (See FIRE DEPARTMENT.)

In the United States a basic patent on gasoline motor cars was issued in 1895 to George B. Selden, but was for many years of very little effect. In 1909, however, a decision favoring the Selden claim was rendered by Judge Hough. Several independent manufacturers united in opposing the Selden claim to royalties; and in January, 1911, Judge Hough's decision was reversed in the U. S. Circuit court of appeals, so that the Selden patent became inoperative. The advance of motor car design has been remarkable since 1895, when the first important speed contest

foreign countries. In the year 1940, 31,104,118 motor vehicles were registered in the United States and 45,422,411 in the entire world.

**Motorcycles.** The motorcycle is the result of the adaptation of the gasoline engine to the propulsion of bicycles. The earlier motorcycle engines were all one-cylindereed, but two-cylinder machines are now common, and some makers are building them with four-cylinder engines. The horse power is from 3 to 7, rated; but some motorcycle engines rated at 7 horse power actually develop 15 to 18 horse power.

Motorcycle engines are always air cooled, to save the weight of cooling water and radi-



*Courtesy Indian Motorcycle Company.*

*Indian Scout, Police Special.*

was won by Levassor in a four-horse-power, pneumatic-tired Panhard car. This ran from Paris to Bordeaux and back—a distance of 750 m.—at an average speed of 15.4 m. per hour. This seems far removed from the world record established by John R. Cobb, on August 23, 1939, at Bonneville, Utah, when he traveled at the rate of 368.85 m. an hour.

The rapid and continued growth of the automobile industry has been one of the marvels of the 20th century. In 1906 there were about 48,000 motor cars of all kinds in use in the United States. The million mark was passed in 1912. In 1939 the production of motor cars passed the 3,575,000 mark. Of these 2,866,796 were passenger cars. Over a quarter million American cars were sold in

ators. The jump-spark ignition system is used, with either batteries or a magneto. The engine and muffler are mounted in the lower central portion of the frame, near the pedal crank. The gasoline tank is made long and narrow, and is hung immediately below the top of the frame. The gasoline capacity is from 1½ to 2 gallons, which is good for trips of 150 to 200 m. The engine is started by pedalling, or by means of a kick starter consisting of a foot crank arranged to give two or three revolutions of the engine by a single downward stroke of the starter crank. Flat footboards are provided for the driver's feet to rest upon. In the case of pedal starting, a coaster brake permits the rider to stop or resume pedalling at will.

Formerly the engine shaft was geared di-

rectly through a chain or leather belt, to the pulley or sprocket on the rear wheel; but the more recent practice is to interpose a friction clutch. With the four-cylinder engine a shaft and bevel gear drive is used instead of chains. With the friction-clutch arrangement, known as the 'free engine' construction, the cyclist can slow down or stop without stopping his engine. Change-speed transmissions are sometimes provided, giving two or three different speed ratios between engine and rear wheel. The control of the engine speed is usually effected by twisting the grips on the handle bars, one grip controlling the throttle and the other the spark. A switch is provided near one of the grips for cutting out the spark when desired. A hand brake is sometimes used, but the foot brake, operated either by the pedals or by a lever close to the footboard, is more commonly provided. A muffler cut-out lever, for reducing the back pressure and increasing the available power of the engine, is operated by one foot. The speed change gears and clutch are operated by hand levers rising vertically from the vicinity of the engine shaft.

Some form of spring fork on the front wheel, as well as special springs on the saddle, is required to diminish the vibration at high speeds on ordinary roads. In 1913 a spring suspension between the motorcycle frame and the rear wheel was introduced, and has now come into extensive use. The wheel base is usually greater than for a bicycle, ranging from 50 to 60 inches. The standard wheel diameter is 28 inches, with  $2\frac{1}{2}$  to 3 inch tires. Ordinary motorcycles of 5 horse power or more are capable of speeds of 100 m. per hour.

**Motor Generator.** See **Dynamo and Motor.**

**Motor Sleighs, or Motor Sleds,** self-propelled vehicles having the whole or a part of their weight carried on runners for use on ice or snow. Propulsion is effected usually through one or more driving wheels with projecting members which grip the snow or ice and prevent the wheels from slipping. Motive power is commonly supplied by a gasoline engine. Motor cars and motor trucks can be converted into motor sleighs by replacing the front wheels, or merely the front tires, with runners, and equipping the driving wheels with tire chains or other devices to secure traction.

**Motor Trucks.** See **Motor Cars.**

**Mott, John R.** (1865- ), American religious worker, was born in Livingston Manor, N. Y. In 1915 he was elected general secretary of the International Committee of the

Young Men's Christian Association. During the Great War, he served as general secretary of the National War Work Council of the Y. M. C. A.

**Mott, Lucretia (Coffin)** (1793-1880), American abolitionist and women's rights supporter, was born in Nantucket, Mass. After teaching for a time, she became an 'acknowledged minister' of the Friends; and in the schism which arose in that sect over the slavery question she championed the cause of Elias Hicks, the advocate of abolition principles. With her husband she was sent as a delegate to the World's Anti-Slavery Convention in 1840; but after much discussion, all women were excluded from active participation in the convention proceedings. This procedure led Mrs. Mott to become a staunch advocate of women's rights. She was also an advocate of temperance and universal peace.

**Mott, Valentine** (1785-1865), American surgeon, was born in Glen Cove, N. Y. He served as president and professor of surgery at the New York University Medical College (1841-50). One of the most noted surgeons of his time, he was the first to amputate successfully at the hip joint, and performed this operation on more than 1000 patients.

**Mottl, Felix** (1856-1911), Austrian musical composer and conductor. In 1876 he took part in the Bayreuth festival performances of Wagner's *Ring* as stage conductor; and in 1881 became conductor of the Ducal Opera House at Karlsruhe, where he raised the standard of the performances until they ranked with the finest in Germany. In 1903 he was made general musical director at Munich. In 1903-04 he conducted *Parsifal* and other German works in New York City.

**Motto**, in heraldry, a pithy word or sentence forming an integral part of the achievement, in England and Ireland usually placed under the shield, and in Scotland above the crest.

**Mouflon** (*Ovis musimon*), the great horned wild sheep of Europe, now found only in Corsica and Sardinia. It is believed to have been the forerunner of the domestic breeds. See **SHEEP**.

**Mould**, a name commonly given to a variety of fungoid growths, usually of filamentous structure, and bearing spores on the summits of erect branches. They usually grow on damp animal or vegetable material. Certain of the mould are highly destructive to vegetable crops.

**Moulting**, the process in which birds get rid of and renew their feathers, and Crustacea

and insects cast off and renew their chitinous cuticle. The term may also be applied to the quite analogous processes in the course of which mammals shed their hair and snakes slough their skin. In most birds and mammals it occurs twice a year, at the time of change from warm to cold weather, and *vice-versa*; but in the lower forms it occurs frequently, especially during youth, as a means of growth.

**Moulton, Ellen Louise Chandler** (1835-1908), American poet, was born in Pomfret, Conn. She contributed to the *New York Tribune* and the *Boston Herald* for several years. She was the literary executrix of Philip Bourke Marston, the English poet, and edited Arthur W. E. O'Shaughnessy's poems. Her verse is musical and sympathetic in character. She published several volumes of fiction and travel and books of poetry.

**Moultrie, Fort**, a fort on Sullivan's Island in Charleston Harbor, S. C., one of the defenses of Charleston. It was originally named Fort Sullivan, but was renamed in honor of its builder and defender, Col. William Moultrie, who on June 28, 1776, successfully defended it against an attack of a British fleet and a land force intended for the invasion of South Carolina. Fort Moultrie was rebuilt during the War of 1812. At the time of the secession of South Carolina it was occupied by Col. Robert Anderson, who on Dec. 26, 1860, removed to Fort Sumter; from it the South Carolinians later bombarded Fort Sumter, and during the Civil War it was one of the defenses of Charleston against the Federals.

**Mound Birds**, or **Megapodes**, game birds which do not incubate their eggs, but deposit them in a mound composed of earth and decaying vegetation. The heat produced by the rotting leaves is sufficient to ensure the hatching of the eggs. Some species, however, merely lay their eggs in holes in the sand, where they are slightly covered; in this case hatching is effected by the heat of the sun. One of the most familiar of the megapodes is the brush-turkey (*Catharturus lathami*) of East Australia. Its mounds are sometimes 6 ft. high, and are constructed in level clearings; the cocks seem to assist in the building, and the same mound is apparently utilized by more than one female. As many as 40 eggs have been found in one of these mounds. Other species occur in the Philippine Islands, New Hebrides, and in the islands of the Malay Archipelago.

**Mound Builders**, a term applied by some ethnologists to a hypothetical extinct people,

precursors of the present North American Indians, who are credited with the crection of the prehistoric earthworks of all kinds—forts, ramparts, mounds—strewn over the Mississippi basin and other parts of the United States, but especially numerous in the Ohio Valley. In Ohio the largest mound is Fort Ancient, in Warren co., a mile long, with over 10 m. of artificial work. Chillicothe, on the Scioto river, is the center of several important groups, such as those of Hopewell, Hope-ton, and Mound City. Many were obviously sepulchral mounds, and contain human remains and various objects, such as earthenware (often of artistic design and elaborate workmanship), finely-chipped flints, hammered copper bracelets, and other ornaments.

**Mounet-Sully, Jean** (1841-1916), French tragedian, whose real name was Jean Sully Mounet, was born in Bergerac. In 1868 he made his début at the Odeon in Paris, and in 1872 appeared in the Comédie Française. He soon became famous for his powerful impersonations, his greatest roles being Achilles, in *Iphigenie*; Hyppolytus, in *Phèdre*, the King, in *Le Roi s'amuse*; Hamlet, and the King in *Cedipe Roi*.

**Mountain Artillery**, more correctly termed **Pack Artillery**, is intended for use in terrain where wheeled transport is impossible or very difficult. The weapons, which must be light and rugged, can be taken apart. The component parts as well as ammunition, stores, and baggage are transported on pack animals. The complement of the U. S. Army is one regiment of two battalions of three batteries each and one separate battalion.

**Mountain Ash** or **Rowan** (*Pyrus* [Sorbus] *aucuparia*), a small ornamental European tree of the family Malacæ. It has light foliage and hard, fine-grained compact wood; but is chiefly interesting for its drooping corymbs of scarlet or yellow fruits which are known as rowan berries. *Sorbus americana*, a similar tree with smooth leaflets, is often planted for ornament.

**Mountain Climbing**, a form of sport practically unknown until well into the Middle Ages. In about 1265, seemingly purely as an adventure, King Peter of Aragon climbed Mount Canigou in the Eastern Pyrenees. Some half century later, Petrarch ascended Mount Ventoux, near Avignon.

With the exception of the Rocca Melone, the first real snow-peak believed to have been ascended is the Titlis, near Engelberg, in canton Unterwalden, by a monk in 1739. Sausure, a scientific man of Geneva, a passionate

lover of mountains offered a reward for the discovery of a route to the summit of Mont Blanc; but more than a quarter of a century elapsed before it could be claimed. Finally, in June, 1786, Jacques Balmat found a practicable way; and on August 8 of the same year he reached the summit, taking with him the village doctor, Paccard. Next year he repeated the feat with two other guides, and a few days later led the party, including 17 guides and a servant, which accompanied Saussure on his classical ascent. Just a week after this, the first English ascent was made by Colonel Mark Beaufoy. Mr. Woodley followed in 1788.

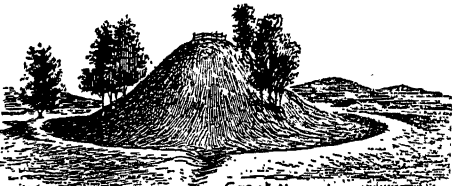
Mr. and Mrs. Workman, who attained an elevation of over 23,000 ft. in the Karakorum range.

Mount Everest (29,002), king of all mountains, has been attempted in recent years. The first attempt was made in 1921. In 1924 Mallory and Irvine were last seen alive at 28,300 feet and it is not known whether or not they reached the summit before they perished. Whymper, Conway, Zurbriggen, and Fitzgerald have found routes to many of the highest summits of the Andes.

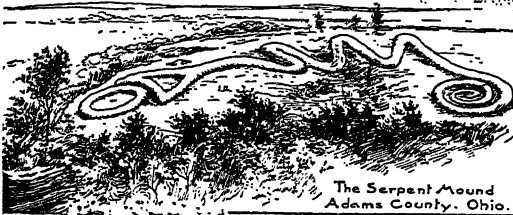
In North America, in 1871, Clarence King published his *Mountaineering in the Sierras*,



Mound and Circle, Greenup County, Kentucky



Great Mound at Marietta, Ohio.



The Serpent Mound  
Adams County, Ohio.



Avondale Mound, Washington Co. Miss.

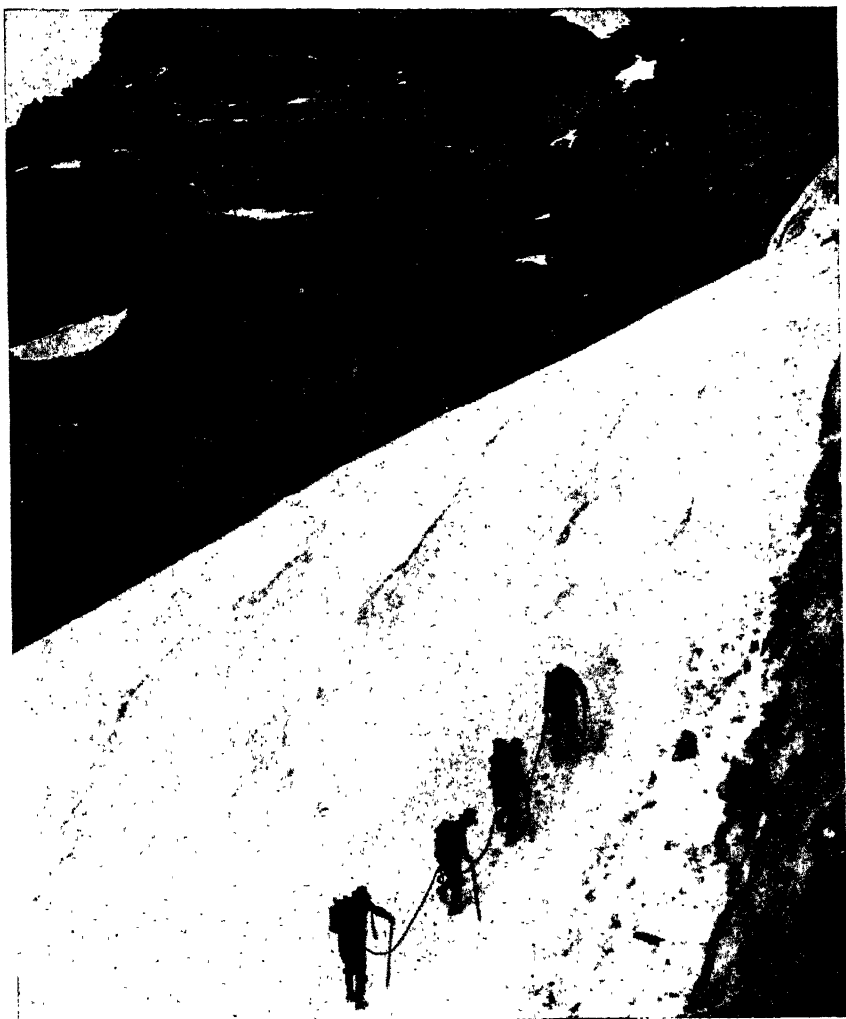
#### Some Noted Mound Structures.

The example set in the West Alps was duly followed in other districts. By 1857 the number of those who sought the high Alps for recreation had so much increased that it was possible to found the Alpine Club (1857). It is noteworthy that not one of the original members of the club, and only one of those who were the leading guides at the date of its formation, lost his life in an accident above the snow-line.

The Alps have not sufficed to exhaust the energies of mountain climbers. As long ago as 1868 Douglas Freshfield and others visited the Caucasus, and climbed some of its principal peaks. Another party was there in 1874, and nearly all the great summits of that chain have now been conquered. In the Himalayas the brothers Schlangintweit, as early as 1855, climbed beyond the line of 22,000 ft. This performance was surpassed half a century later by the ascent of Pioneer Peak, in the Karakorum range by Sir William Conway and his Swiss guide, Zurbriggen, whose feat was eclipsed by that of the American mountaineers

and in 1870 N. P. Langford and party made the first ascent of the Grand Teton. A wider interest in mountaineering dates from the founding of the Appalachian Mountain Club (Boston, 1876). In 1892 the Sierra Club was founded at San Francisco, and in 1894 the Mazamas, in Portland, Ore., for the ascent of the great snow peaks of the Cascade Range. Mount St. Elias was scaled in 1897 by the Duke of the Abruzzi, after several unsuccessful attempts by Americans and others. Mount McKinley, the loftiest peak in North America, rising to a height of about 20,000 ft. situated within four degrees of the Arctic Circle, was scaled by Archdeacon Stuck in 1913. In 1902 the American Alpine Club was organized following the opening up of the American and Canadian Rockies, which in turn was followed by the opportunity for Alaskan climbing. The narrative of these ascents is recorded in a rapidly increasing literature.

A party of climbers from Boston—H. Bradford Washburn, Jr., Walter Everett, and Robert H. Bates—ascended in 1933 within 500 ft.



*Copyright Ewing Galloway, N. Y.*

*Climbing Mount Assiniboine, Canada.*

of the summit of Mount Crillon (12,725 ft.) of the Fairweather range on the Alaskan coast, while others of the party made photographs of other peaks of the range which had been unknown and unnamed up to that time. Soviet expeditions have gone high in the ranges of the Pamirs, partly for sport, partly in search of minerals. In the Alps, in 1938, four Germans ascended the previously unclimbed Eigerwand face, and three Italians were the second party to ascend the north face of the Grandes Jorasses. Both these hazards have

cost lives of many climbers. See also National Geographical Society publications.

**Mountain Goat.** See **Rocky Mountain Goat**.

**Mountain Lion**, the name given in the Western United States to the puma or cougar, which formerly was sometimes known as 'catamount' in the Eastern states. See **PUMA**.

**Mountains**, lofty elevations, usually rocky, towering above the surrounding country. In a typical mountain range certain features are always present. It consists not of a single



ridge, but of a chain of elevations; and in the greater mountain systems many subordinate ranges may be present, running nearly parallel to one another, rarely branching or uniting, but as one dies out another rises and gradually assumes importance. The axial ridges are usually the highest; on each side of the range the mountains give place to lower elevations, often known as foothills, which in their turn merge into the surrounding plains. The higher peaks are mostly bare and rocky, often consisting mainly of sharp knife-edges, flanked by steep slopes. Around them lie the snow-fields from which the glaciers take their rise. At lower elevations the rocks are covered with a close growth of alpine plants and short grass. Still lower down the trees make their appearance, at first stunted and scattered, but soon in dense thickets. The glaciers flowing down the valleys usually reach the zone of forests before they melt away. Each altitude is marked by a characteristic climate and fauna and a distinctive type of agriculture.

The heights are separated by valleys. Between the main ridges the valleys are longitudinal or parallel to the axis of the range. Transverse valleys run nearly perpendicular to these, and are often of great importance as affording the easiest passes by which the mountains may be crossed. The principal rivers which drain a mountainous area are often not confined to one or other of these valley systems, but, after flowing for a time in a longitudinal valley, may suddenly enter a transverse depression, which again they may desert after a longer or shorter course. The rocks of which the greater mountain ranges consist are usually vertical, or at any rate highly inclined, and when carefully examined are found to have been thrown into closely-packed folds. The process of mountain-building must in all cases have been very slow. Each system has had one great epoch of activity; but this has usually been preceded by minor episodes of earth movement and long ages after completion has apparently been attained, earthquakes and volcanic activity may continue to affect the region.

The geographical features of a mountain range depend not only on its geological structure and the manner in which upheaval operated, but also, and probably to an equal extent, on the denudation to which it has been subsequently exposed. The sharp, serrated lines of peaks express vividly the gnawing action of weathering, frost, and rain; the steeper slopes are often veiled by a mantle of loose

stones, which show how potent are the agents of disintegration. The immense thicknesses of rock which have been swept away are indicated by the constant occurrence of the oldest geological strata in the central and highest mountains. These were once buried under great depths of younger formations, the broken edges of which may be found among the lower hills on each side. The rivers have carved the valleys and passes, and in so doing have shaped the existing surface forms. The age of a mountain chain must be less than that of the youngest beds which have been involved in the folding and upheaval. In this way we can tell that the Alps, Carpathians, Caucasus, Pyrenees, Himalayas, and Rocky Mountains have received their principal uplift in Tertiary times.

Geologists know that in the rocky strata of the earth's crust there are belts of intensely-folded rocks which are plainly the roots of older mountain chains, but very often they are represented on the surface only by ranges of low hills or by flat, eroded tablelands. Such are the region of the ancient crystalline rocks around the Great Lakes, and the Highlands of the Hudson. Other mountains have been elevated not by processes of compression and folding like those described above, but by the rise of a block of the earth's crust, which is bounded on each side by parallel fissures. In the Rocky Mountains the earth's crust has not been greatly plicated, but has been thrown into long, gentle curves, which are often broken by faults. Many of the most famous mountains are volcanic, and have been piled up by the accumulation of igneous rocks (lavas and beds of ashes) around an orifice or crater. They are consequently 'mountains of accumulation,' and are not directly due to subterranean movements. Etna and the mountains of Iceland, the high Mexican peaks, Mount Shasta, Mount Hood, Mount Rainier, and others in the Western United States, Kilimanjaro in Africa, and the lofty mountains of Java and Ecuador are examples. The loftiest mountains in the world are in the Himalayas, the highest known peak being Mount Everest, 29,141 ft. There are fifteen other Himalayan peaks exceeding 20,000 ft., and four others in Asia. The highest North American peak is Mount McKinley (Alaska) 20,300 ft.; the highest South American peak, Mt. Aconcagua, 23,290 ft. Citlaltepetl, or the Peak of Orizaba, in Mexico, is 18,564 ft.; Mt. St. Elias, in Alaska, is 18,024 ft. The highest European peak is Mont El

Bruz, in the Caucasus, 18,465 ft. Kibo Peak (Kilimanjaro), 19,456 ft., is the highest point in Africa.

**Mount Auburn**, a famous cemetery near Boston, Mass., where are the graves of many great Americans.

**Mountbatten, Lord Louis** (1900- ), son of Prince Louis of Battenberg; head of the Commandos and chief of combined operations of the British Army, Navy and Royal Air Force. In Aug., 1943 he was made Allied Supreme Commander in Southeast Asia.

**Mount Carmel**, in Palestine. See **Carmel**.

**Mount Carmel**, borough, Pennsylvania, Northumberland co., a coal-mining center and a shipping point for anthracite, which is plentiful in the vicinity; p. 17,780.

**Mount Clemens**, city, Michigan, county seat of Macomb co., at the head of navigation on the Clinton River, 20 m. n.e. of Detroit. The old government road, known as the Gratiot Road, from Detroit to Port Huron, paved throughout its length, passes through the city. Its mineral waters have made the city famous as a health resort; p. 14,389.

**Mount Desert**, mountainous island, Hancock co., Maine, 15 m. long and 8 m. broad; a favorite summering place. Lafayette National Park, created in 1919, occupies 8 sq. m. and includes a group of granite mountains and several picturesque lakes. Bar Harbor is the most popular resort. The island was discovered and named in 1604 by Champlain, who called it the Isle of Monts Deserts; p. 10,000.

**Mounted Infantry** are troops which are intended to fight on foot as infantry, and which are mounted on horses, mules, camels, wagons or motorcars solely for the purpose of enabling them to march more rapidly, farther, and with less fatigue than ordinary infantry. In World War II the mounted infantry was known as the 'iron cavalry.' It consisted of armored cars, trucks, tanks, and motorcycles. The scout car was used for reconnaissance.

**Mount Holly**, town, New Jersey, county seat of Burlington co., is the trade center of an agricultural district; p. 6,892.

**Mount Holyoke College**, a non-sectarian collegiate institution for women at South Hadley, Mass. It was founded by Mary Lyon as Mount Holyoke Female Seminary in 1837; and rechartered under its present title in 1893.

**Mount of Olives**. See **Olives**, **Mount of**.

**Mount Rainier National Park**. See **National Parks**; **Rainier**, **Mount**.

**Mount St. Mary's College**, the second oldest Roman Catholic college in the United

States, was founded in 1808. It is located near Emmitsburg, Md., on an elevated site among the foothills of the Blue Ridge.

**Mountstephen, George Stephen, First Baron** (1829-1921), Canadian capitalist, was born in Dufftown, Banffshire, Scotland. He emigrated to Canada in 1850, and became president of the Bank of Montreal. In 1880 he was associated with Donald Smith (Lord Strathcona) and other Canadian capitalists in the construction of the Canadian Pacific Railway, of which he was president from its inception until 1888, when he retired, thereafter making his home in England and Scotland.

**Mount Union College**, a coeducational institution, was founded in Alliance, Ohio (1846). It was the first institution in the United States to graduate women on an exact equality with men.

**Mount Vernon**, city, Westchester County, N. Y., residential suburb of New York City; manufactures soap, dyes, rotogravure presses, electric vehicles and devices, spark plugs, lenses, bronze, women's apparel, silverware, medical supplies, refrigerators, paper clips; p. 67,362.

**Mount Vernon**, city, Ohio, county seat of Knox co., on the Kokosing River. It is the seat of the State Sanatorium for Tuberculosis and of Mount Vernon Academy. Kenyon College and the Harcourt Place School for girls are six m. e. of the city; p. 10,122.

**Mount Vernon**, city, Washington, county seat of Skagit co., on the Skagit River. The State Highway from British Columbia to Mexico passes through the city. The surrounding district is protected from high tides and rivers by 125 m. of dikes. It is a rich farming country, producing oats, hay, potatoes, fruit, and garden seed. Dairying is the most important industry; p. 4,278.

**Mount Vernon**, the estate of George Washington, in Fairfax co., Virginia, on the right bank of the Potomac River, 15 m. s.w. of Washington, D. C. The old mansion is situated on a picturesque plateau, 200 ft. above the river. It was built in 1743 by Lawrence Washington, and came into the possession of the General in 1752. The remains of Washington and his wife lie in a brick tomb on the estate. In 1859 the house with six acres was purchased by the Mount Vernon Ladies' Association to secure the place as a lasting memorial.

**Mount Washington**. See **Washington**, **Mount**.

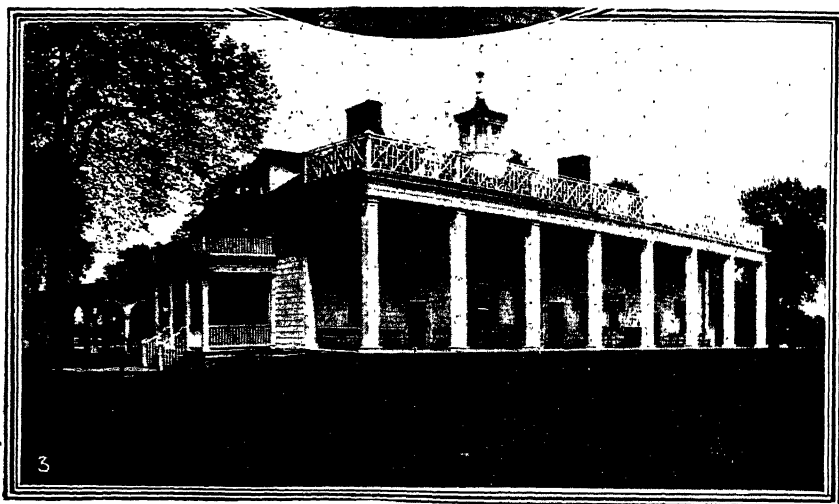
**Mount Wilson Observatory** is located on the summit of Mount Wilson, one of the peaks

of the Sierra Madre range, 9 m. from Pasadena, Calif. It was founded in 1904 by Dr. George E. Hale, Director until July 1, 1923. The Observatory was built and is maintained by the Carnegie Institution of Washington, of which it is the astro-physical department. The instruments located on Mount Wilson are among the finest in the world, including telescopes of great range, a 100-inch reflector, etc. Some of the most striking recent discoveries and observations have come from this scientific center.

tively large ears, long tail, and almost uniform brown coloration. In America are found the white-footed mice, or field mice, which belong to the genus *Peromyscus*; the short-tailed meadow mice of the genus *Microtus*, and a great number of western forms; also the jumping mice (*Zapodidæ*), which are more nearly allied to the jerboas than to the true mice (*Muridæ*).

**Mouse-deer**, an East Indian chevrotain.

**Mousquetaires**, French household troops of noble birth, originally formed (1622) by



Mount Vernon.

**Mourning Cloak**, a large, common, and widely distributed butterfly (*Vanessa anti-ope*), which appears numerous in spring throughout the United States and Canada, having hibernated through the winter. The general color of the butterfly is purplish brown, the wings broadly bordered with yellow, within which is a brown band containing purple spots.

**Mouse**, a name applied to the smaller members of the genus *Mus*, and by analogy also to various other small rodents similar in appearance or habits to the true mice. Rats and mice are alike in having long, scaly tails, in their comparatively large ears, the pointed and naked muzzle, and in having three longitudinal rows of tubercles on the molar teeth of the upper jaw. The difference between the two, excepting in the matter of size, is largely arbitrary. The house mouse (*M. musculus*), is now cosmopolitan, but was originally a native of Asia. It is distinguished by its rela-

Louis XIII. They consisted of two companies, called the 'Gray' and the 'Black,' from the color of their horses. Their most famous captain was Charles de Batz, Comte d'Artagnan (1621-72), a real personage, the hero of *Les Trois Mousquetaires*, by Dumas père. Suppressed (1791), and revived (1814), the Mousquetaires were finally disbanded in 1815.

**Mouth**, the opening through which food is received into the body. In vertebrates, the mouth is bounded by jaws. Lips provided with muscles first definitely appear in mammals. As regards the important organs of the mouth cavity, the teeth are considered in a separate article. The tongue is, as a rule, not well developed in fishes; and not being furnished with muscles, is capable of but little movement. In the higher amphibia and onward the tongue is muscular, and usually freely movable, though it is not well developed in birds. It reaches its highest degree of development in mammals. Glands appear in connection with

the mouth from amphibia onward. The digestive importance of their secretion reaches its maximum in mammals; but the poison glands of some reptiles should be noticed as a specialization of the mouth glands. The human mouth consists of two parts, the vestibule, or outer smaller portion, and the oral cavity or inner larger part. The roof of the mouth is formed by the hard and soft palate, and its floor by the tongue and the reflection of the mucous membranes from the under surface of the tongue to the gum. The mouth receives the secretions of the salivary glands.

**Moving Pictures, or Motion Pictures,** a popular form of entertainment and instruction made possible by the cinematograph, a device for projecting upon a screen a series of instantaneous photographs in such rapid succession that they reproduce the action photographed in a continuous and lifelike manner.

The idea of reproducing a moving scene in this fashion was conceived and developed by a blind man, Plateau of Ghent, who in 1833 manufactured a toy—which he called a ‘phenakistoscope’—designed to create the illusion of continuous motion by means of numerous drawings viewed in rapid succession. The ‘zoetrope,’ which gained considerable popularity in 1860, was a modification of Plateau’s work, but was still looked upon as merely a toy. The use of a large viewing screen, originated by M. Renaud in France, in 1877, gave the idea its first exhibition value, but the projection was still entirely from drawings. In the meantime, M. Muybridge was experimenting with photography, with a view to its adaptability to the machine. Using the dry plate, then recently invented, he obtained in 1877 a series of photographs of a moving object by stationing along its path a battery of cameras and making a succession of exposures as the object passed. The first real success in motion pictures, however, did not come until the invention of the ribbon film (1888), followed by the invention of special cameras by Friese-Green (1888) and Evans (1890), capable of ten exposures per second.

In 1894, Thomas Edison brought out his kinetoscope, a device by which a series of pictures about the size of a postage stamp was projected from a film behind which was a small electric lamp. The observer viewed the picture through a slit in a rapidly rotating shutter, each picture being visible for the fraction of a second, giving a startling effect of continuous motion. Lumière expanded the entertainment capacity of the film from the single patron to the group by the use of a lan-



*Specimen of Cinematograph Films.*

Left, Dancer; right, part of a high dive.

tern projecting the pictures upon a large screen. This was introduced in 1895. The

basic principles laid down at that date have never been seriously altered.

The pictures used in the cinematograph are made with a special camera, wherein the sensitive film moves in steady flow through the focal plane of the lens, with a short focus to admit the maximum of light, while still retaining a maximum depth of field. A revolving shutter makes instantaneous exposures on the film at the average rate of sixteen per second. The film is advanced from packs through the exposure field by a series of small gears, the cogs on the wheels grasping the perforated borders of the film. The negative film is  $1\frac{3}{8}$  in. wide, and each picture measures one inch by three-quarters of an inch. Development of the negative proceeds by regulation methods, the positive prints being secured from the negative by a reed mechanism operated in association with a rotating shutter and propelling rollers. Tinting of the positive film is done by bath, all shades being used to obtain various desired effects. Greater sensitiveness to light is constantly sought to reduce the cost of studio lighting.

Motion picture cameras were originally operated by hand, with an average of sixteen turns of the handle to the minute, the operators becoming habitually precise in the evenness of the speed. An electric motor soon superseded hand control. When the action must be sped up for the screen, the speed of the camera declines; when the action is to appear leisurely on the screen, the turns of the camera are quickened. Great improvement has been made in rapid-action photography. Ultra-speed cameras are rapidly being developed for all types of photography; one of American invention in 1933 drives the film continuously, using 16 millimeters of film and making 2,500 pictures per second.

The earliest moving pictures were simple demonstrations of action—a horse eating hay, a group of people walking along the street, children swinging—and the entire foreground was always in focus. Such pictures found their chief field of usefulness as a 'house-clearing' feature on the continuous vaudeville program. When D. W. Griffith introduced a picture with a plot, serious opposition arose, for the audience, instead of leaving the theatre as the managers intended, remained to watch the drama. So serious was the situation that a meeting of producers was called (1909) to consider whether the innovation were not a dangerous one. The problem was eventually solved, however, by giving the picture a place in the middle of the program,

thus establishing it as a legitimate form of entertainment. The 'plot picture' introduced still another difficulty. Since the characters were acting too far from the camera to permit the entire background to be in focus, some method of identification was necessary. It became the custom, therefore, to dress the villains in dark clothing and the heroic characters in light dress. The exaggerated acting necessary for registering the pantomime in these early pictures made the moving picture unpopular with actors, and players from the stage could sometimes be secured only on promise that they might make up so that no one could identify them, and that their participation would be held a secret. The first prestige given the new medium came with the technical development known as the 'close-up,' an effect obtained by bringing the camera nearer to the player, so that the background was lost in the focus. D. W. Griffith, who made the experiment, at first dared attempt no less than a full figure of the player, but realizing the improvement, finally showed the head and shoulders only. The reaction of the public was so favorable that producers soon realized that the scope of the motion picture had been immeasurably expanded. The true art of pantomime was now possible for the screen, and actors of the legitimate drama began to appreciate the possibilities of the new medium. It was not until a second historic improvement was introduced, however, that the photoplay as it is known to-day became possible. The early producers had been careful to obey the established rules of drama as laid down by the Greeks, observing the unities of time and place. In a production by D. W. Griffith in 1910 the unity of place was first ignored, action being shown taking place simultaneously in different locations. This method was first employed in a picture in which the heroine was placed in a barrel and thrown into a stream, the action cutting back and forth from the girl in peril to the horrified on-lookers on shore. The success of this experiment became the backbone of photoplay construction. Motion pictures, now, for the first time, seriously challenged the stage for popularity. The earliest moving pictures were made in 'split-reels,' two or three complete pictures, three hundred to five hundred feet in length, to the reel. With the introduction of the plot, the length advanced to one reel. Then a story was attempted which could not be compressed to the customary thousand feet. It was made in two reels, and was rejected alike by producer and exhibitor, who declared that no audience would tolerate so

long a picture, and that its showing would disrupt the exhibiting machinery. Shortly after this, the first two-reel picture was shown, followed by three and four reels, and eventually by the five-reel feature. The spectacle film, varying in length from 8,000 to 14,000 feet, came in 1914.

The preparation of a motion picture begins with the selection of a story by the scenario staff, generally to meet the requirements of a particular player or director. The story is then delivered to a continuity writer, who drafts the plot into scenes to be photographed. These continuities include the smallest details, indicating every movement of the players and furnishing full directions as to the location of the camera. The sets for a motion picture are designed by the art director, who must possess the qualifications of both architect and artist. The scene department constructs the sets, and the electrical department lights them. Studio lighting has become a highly specialized work, as all scenes are painted with lights and shadows, to lend perspective, beauty, and emphasis to the area of action. Many refinements have been made in photography, but few radical improvements. One development is the so-called 'mist' photography, providing an aura of hazy softness for the scenes. It is gained by photographing through a gauze stretched in front of the camera lens. Novel effects are also gained by double, triple, and even sextuple exposures on a single film, parts of the film being exposed at a time to varied action and background. This method was used in *The Ten Commandments*, six scenes being super-imposed on a single film to illustrate the parting of the Red Sea. Another method of gaining unusual effects is by painting backgrounds on glass, and photographing the action of the scene against these backgrounds. Miniatures are also used, the camera enlarging them to natural proportions, a form of 'trick photography' carried to great realistic effect in the *Thief of Bagdad*, with such scenes as the flying carpet, and the winged horse galloping across the sky.

With the emergence of the motion picture from the restrictions of one and two reels, came the establishment of theatres for the exclusive showing of films. Originally the theatres were owned by individual exhibitors, but the more successful of these gradually acquired additional houses, which have now been organized into 'chains,' some of but a few theatres, and others of a very large number. The making of news pictures has devel-

oped into a special branch of the motion picture industry. Large staffs of photographers are maintained in all parts of the world, and scenes taken by independent photographers are also purchased for release at specified terms.

The animated cartoon is another special type of picture, made by taking separate photographs of thousands of drawings. Still another type is the film showing the growth of a plant, the unfolding of a bud, the healing of a wound, or other incident requiring considerable passage of time for its completion.

The vividness of the moving picture, its accuracy of detail, atmospheric reality, compactness and ease of circulation have recommended it for a wide variety of purposes besides mere entertainment. More than two hundred universities and public schools in forty States are now using motion pictures in the class room, and 'visual education' departments have been established in many educational institutions. The use of films in science and surgery is also reported.

The actual date which marked the beginning of the modern 'talking picture' is generally conceded to be Aug. 6, 1926. On that day a New York audience viewed Warner Brothers' *Vitaphone* production, *Don Juan*. In January, 1927, William Fox produced his *Movietone News Reel*, and in October 1927 the spontaneous success of *The Jazz Singer* proved the popular demand and stable business for the new art. The modern sound picture is possible only because of the vacuum tube and the vacuum tube amplifier. A microphone, five, ten, or even fifty feet away replaces the old-time horn, and audio amplifiers step up its feeble energy output to a degree sufficiently great to actuate an electromagnetic recording device.

There are two standard methods of recording sound. One is called the 'sound on disc' method and the other 'sound on film' method. The correct engineering terminology is, however, 'Sound-on-Disc' or 'Sound-on-Film.' For both methods of recording the apparatus is the same up to the final unit or the recorder itself. A single 'channel' or recording unit is composed of a condenser microphone, the output of which is fed into a series of powerful amplifiers. A 'mixing panel' or flexible volume control limits the input to the amplifiers. A 'disc recorder' is connected to the output of the amplifiers for recording sound on disc and a 'film recorder' for recording sound on film. The function of the microphone is obviously

the important one of changing acoustic energy into electric energy. The condenser microphone is a far less sensitive device than the carbon button or common telephone variety of microphone, but it is free from the annoying 'hiss' encountered in the carbon button microphone, and its range of faithful frequency response is much greater. These qualities account for its use for recording Sound motion pictures where faithfulness of recording and reproduction is the paramount consideration.

There are two commercially practical methods of achieving faithful records of sounds on film and there are two distinct types of recording machines. The Western Electric Company through its subsidiary Electrical Research Products Inc. sponsors a method of film recording known as the 'variable density'—constant area recording. All sounds on film records are made on the same film as the motion picture and occupy a space called a 'sound track.' The 'constant area' indicates merely that the sound record occupies the entire width of the sound track throughout the length of the film. The 'variable density' phrase typifies the nature of the record and explains that the record varies, in the direction of the length of the film, from dark to light and vice versa. The record is composed of alternate dark and light bands or marks on the film caused by permitting a changing beam of light to fall upon the film sound track as it passes through the recording machine at a speed of ninety feet per minute. Only the 'sound track' portion of the film is exposed to the light source in the 'film recorder.' The remainder is marked off. While the film record is being made in the recording room, the motion picture camera is making the picture record in the studio. The camera employs a mask to cut off light from the sound track portion of the film. The motor driving the recording machine and the motor driving the camera are electrically interlocked so that both run at the same speed and each one turns over exactly the same number of times. The result is two negative films, one of the sound record and one of the picture record. These two negatives are printed on a third piece of film and a completed 'sound on film print' is obtained. It is this final 'print' which reaches the theatre.

The RCA Photophone, Inc., an RCA subsidiary, appeared in the field (1928) with another system of recording sound on film and it is defined by the phrase 'constant density-variable area' recording. The sound record

occupies a space  $1/10$ " just inside the sprocket holes and running the length of the film and the record is of the same density throughout but does not cover the entire width or  $1/10$ " dimension of the track. Instead it has a continuously varying saw-tooth appearance. The recording is accomplished by a 'vibrator' or 'mirror galvanometer.' Sound on film records have certain frequency limitations but possess so many advantages that the industry is speedily adopting this form of record in place of the formerly widely used disc process of recording sound. Sound recorded on a film must inherently be in step with the picture recorded on the same film. It is impossible to have sound and picture out of synchronism when reproduced from a 'sound on film print.'

Sound on film and Sound on disc records are reproduced in the theatre by attachments connected to regulation silent motion picture projectors or by complete picture and sound projectors constructed as one unit. Sound on film reproduction is accomplished through the medium of the photo-electric cell. This important device has the property of converting fluctuations of a beam of light into fluctuations of an electrical voltage and hence electrical current. During recording, the variations of pressure caused by the sound have been recorded as photographic impressions upon the edge of the picture film. If this film be made to intercept a steady beam of light, the photographed sound record, either variable area or variable density, will cause the beam to fluctuate in faithful accord with the original sound. As in silent motion pictures, where two projectors are required for a continuous showing, so in Sound motion pictures two projectors are necessary so that there shall be no interruption of sound. The picture is changed from one projector to another merely by cutting off the light from the first and turning it on the second projector. Sound change-over is effected by means of a 'fader' or double potentiometer one half of which is connected to each Sound-head. A movable arm permits selection of suitable electrical output from either half. All theatre sound systems consist of the 'sound projectors' just described and of suitable powerful amplifiers and power supplies coupled to horns behind the screen. It is necessary that the amplifiers have a power amplification of about 1,000,000 times the original power. Since the sound on film record has been recorded at a speed of 90' of film per minute, it is essential that it be run at exactly this speed during reproduction. Various complicated electrical controls and

mechanical filters on the driving mechanism are employed to achieve this result.

Color animated sound cartoons were developed by Walter Disney in 1933. These marked an advance step in composition.

The investment involved in the motion picture industry reached (1941) the considerable figure of \$2,000,000,000, not including the investment in Sound equipment alone of about \$500,000,000. It was estimated that there were about 65,000 motion picture houses in the world, of which fully a third were in the United States. Consult *Cinema Handbook*; Griffith's *When the Movies Were Young* (1923); Cameron's *Motion Picture Projection*; Crandall's *Theory of Vibrating Systems and Sound* (1930); Watson's *Recording Sound for Motion Pictures* (1931); *Cinematographer's Annual*; *Journal of the Society of Motion Picture Engineers*.

In the 1930's a noticeable attempt was made by better producers to treat more artistic and controversial themes. Three Shakespearean plays, *Romeo and Juliet* (1936), *A Midsummer Night's Dream* (1936), and *As You Like It* (1937), enjoyed a wide popularity. Picturization of historical events and personages was increasingly evident. With the appearance of *Fury* and *Winterset* in 1936, a more honest treatment of the clash of social elements was available for movie audiences. A drawback in the industry was the vigorous censorship and boycott campaigns instituted by foreign countries, especially Germany and Italy. Since a substantial part of the revenues of the Hollywood producers is made from foreign releases, these restrictions had a definite tendency to lower the quantity and quality of the American productions. New markets, however, were developed in South America and in the Far East. The chief bone of controversy in the 1930's lay in domestic censorship. After furor early in 1936 over the sensual flavor of motion pictures, a voluntary censorship was imposed.

The dissemination of otherwise inaccessible information has admitted the motion picture to schools. At several colleges, courses are given on the technical and cultural aspects of the cinema industry.

In 1941 the industry lost most of its foreign markets and heavy demands were made upon it to meet the needs of a nation at war. In 1942 there was a trend toward comedies and musicals as well as toward pictures with war backgrounds. In 1941 the industry had in the U. S. some 280,000 employees and an annual payroll of about \$400,000,000.

**Mowbray, Harry Siddons** (1858-1928), American painter, was born of English parents in Alexandria, Egypt. He was appointed to West Point in 1875, but resigned in 1876 to study art in Paris. On his return to New York, he devoted himself to easel pictures, illustrating, and teaching. Among the best works of this period are *Aladdin*, *Evening Breeze* (Clarke Prize of the National Academy), and *Le destin*. Later Mowbray gave his chief attention to mural decoration, some of his most important work having been done for the University Club, the appellate Court Building, and the J. P. Morgan Library, in New York City; the Federal Court House in Cleveland; F. Vanderbilt's house in Hyde Park; and the art gallery of Breckenridge Long in St. Louis.

**Moyne, Pierre Le.** See Iberville.

**Moyobamba**, capital of the department of San Martin, Peru, on the Mayo or Miguel River. It is cut off from the Pacific section of Peru by the Cordilleras, and lies 2,800 ft. above sea level. It produces gold, coal, iron, bananas, cacao, and manufactures straw hats; p. 11,000.



*Wolfgang Amadeus Mozart*  
(After the painting by Tischbein.)

**Moyse, Hyacinthe** (1769-1801), Haitian negro revolutionist, nephew of Toussaint L'Ouverture, was born in San Domingo. In 1794 he joined forces with his uncle, and compelled the English to leave the island in 1798.

**Mozambique**, a district of Portuguese East Africa, bounded on the n. by the Rovuma River, and on the s. by Zambezia. From Cape Delgado to Angoche are numerous ports, such as Ibo, Pemba, and Mozambique. Inland,



the country, gradually rising, is covered with forest. Area 287,756 sq. m.; p. 3,528,778, of whom 3,479,042 are natives. Also, the former capital of the above, a seaport on an island, in the entrance to Mossoril Bay; p. about 7,000. Mozambique Channel, between Madagascar and E. Africa, is 950 m. from N. to S., it narrows between Mozambique and Cape St. Andrew to 250 m.

**Mozart, Wolfgang Amadeus** (1756-91), Austrian musical composer, was born at Salzburg. He received most of his musical education from his father, Leopold Mozart, musical director to the archbishop of Salzburg. Besides the piano—which he began to study when little over three years of age—Mozart was taught the violin and organ, and almost from the first began to work at composition. His sister, Maria Anna, five years older, was also a gifted pianist, and in 1762, after a gratifying reception at Munich and at the court of Vienna, the trio set out on a European tour, which lasted several years, Wolfgang playing the piano, violin, and organ, and everywhere creating a profound sensation. For a considerable period subsequently, Mozart was taken on frequent tours throughout the Continent. While in Rome in 1770 he visited the Sistine Chapel to hear Allegri's famous *Miserere*, and after a single hearing performed the marvellous feat of writing the whole of this celebrated composition from memory. Mozart's reputation as a composer grew. In 1781 Mozart left home and settled in Vienna. After the success of his opera *Don Giovanni*, to induce Mozart to remain in Vienna the Emperor Joseph II. appointed him composer to the court, at a salary of about \$400 a year. Though always in the grinding grip of poverty, Mozart was constantly composing, and even to within a few hours of his death was working at his unfinished *Requiem*. Mozart left over six hundred works. His system of instrumentation enabled him to secure a hitherto unapproached richness and variety of orchestral tone-color. Of his forty-nine symphonies, the last three—in E♭, G minor, and C ('Jupiter')—are imperishable works of art; while, as an operatic composer, Mozart was, and in some respects is still, unrivalled. His most celebrated operas are *Le Nozze di Figaro* (1786), *Don Giovanni* (1787), and *Il Flauto Magico* (1791). His other vocal compositions consist of masses, motets, choruses, duets, songs. His numerous productions in the domain of chamber music and his many concertos for piano, for violin, and sonatas, still have an honored place in the repertoire of nearly all great performers.

**Muanza**, district, Tanganyika, East Africa, comprising the rich cattle country Usukuma and the barren Masai plains e. of Victoria Nyanza.

**Mucilages**, solutions of gum or glue in a fluid condition—gum arabic, dextrine (British gum), glue, gelatine, and gum tragacanth being the commonest ingredients employed. Dextrine forms the best solution when dissolved in cold water, and is the mucilage which is used for coating stamps. Glue and gelatine can only be kept in a fluid condition by the addition of glycerine, vinegar, or an acid, such as nitric. Mucilages are employed in medicine for the suspension of insoluble drugs, gum acacia and tragacanth being used.

**Mucin**, a complex viscid substance found in the human body. It can be split up into a proteid and a carbohydrate (animal gum). It is most abundant in intercellular substance, but it is also found in the saliva, the gastric juice, bile, and all mucus.

**Mucous Membrane.** See **Epithelium**.

**Mud**, the finest débris of rocks, produced by the decomposition or detrition of harder masses; when consolidated it forms 'mudstone,' 'clay,' or 'clay rock.' Mud deposits are formed principally in sheltered estuaries, fresh-water lakes, stagnant bends in streams, deep, quiet hollows surrounded by shallower water, and on the ocean bed far from land.

**Mudar**, a genus of Asiatic plants belonging to the order Asclepiadaceæ. The inner bark furnishes a fibre woven into cordage, and even the down of the seeds is made into a silky floss or thread.

**Mud Volcanoes** are produced by the ascent of bubbles of gas through masses of liquid mud. Such mud volcanoes are found in the Yellowstone Park. In others, gases of the petroleum group are emitted, as in several parts of North America.

**Muehlenbeckia**, a genus of shrubs and sub-shrubs belonging to the order Polygonaceæ. The New Zealand climbing plant, *M. complexa*, is the most useful species for greenhouse cultivation. It is of graceful habit, and bears fiddle-shaped leaves and glistening fruit clusters. *M. platyclados* is an interesting greenhouse plant, having broad, ribbon-like branches instead of leaves, and red or purple fleshy perianths.

**Muezzin**, the official attached to a mosque, whose duty it is, from one of the lofty minarets, to summon the faithful to prayer, five times daily—at dawn, noon, about 4 in the afternoon, sunset, and after dusk. The traditional summons is as follows: 'God is great!

(thrice). There is no God but Allah (twice). Mohammed is the messenger of God (twice). Come ye to prayer. God is great! (twice). There is no God but Allah.

**Mufti**, an expounder of the Mohammedan law, one of the theologians and lawyers upon whose interpretations of the Koran the cad, or judge, is supposed to depend for his decisions. The mufti's functions are a combination of those of public prosecutor, or advocate, and assessor. In 1924 the office was abolished by the Turkish Republic. The word mufti is used to mean civilian clothing in distinction to uniform, particularly in the British service in India.

**Mugwump**, a term employed during the United States presidential election of 1884, to designate the seceding Republicans who voted for Cleveland, because of his devotion to civil service reform. The term was afterwards applied to all who affected to be superior to party affiliations.

**Mühlenberg, Frederick Augustus Conrad** (1750-1801), American clergyman. From 1773 to 1776 he was pastor of the Christ German Lutheran church in New York City. He removed to Pennsylvania, devoted himself to a political career, and was speaker of the House in Washington's first administration.

**Muhlenberg, Heinrich Melchior** (1711-1787), German-American Lutheran missionary, went in 1742 to Pennsylvania in response to a call from the Lutherans of that province for missionaries to work among them. He gradually extended the Lutheran organization through Pennsylvania and the adjacent provinces. In 1748 the first American Lutheran synod was formed. Muhlenberg was the founder of American Lutheranism.

**Muhlenberg, John Peter Gabriel** (1746-1807), American preacher and soldier. He was pastor of Lutheran churches until in 1775, at Washington's request he accepted a colonel's commission in the American army, and raised three hundred recruits among his congregation. His regiment was known as 'the German regiment' and was noted for discipline and efficiency. He held important Pennsylvania offices and was a member of Congress, 1789-91, 1793-5, and 1799-1801. He was then chosen U. S. senator from Pennsylvania, but resigned to become supervisor of revenue for the district of Pennsylvania, and in 1803 collector of the port of Philadelphia.

**Muhlenberg, William Augustus** (1796-1877), American clergyman, great-grandson

of Heinrich M. Muhlenberg, became, in 1846, rector of the Church of the Holy Communion in New York City. Here he labored to bring about the founding of St. Luke's Hospital.

**Mühlhausen**, town, Germany, in Saxony. It has a mediæval town hall and the churches of St. Blasius (12th century) and St. Mary (14th century). Mühlhausen was an important commercial center at the beginning of the 14th century, being on the main route from Hamburg and Bremen to Nuremberg and Augsburg; p. 35,955.

**Muir, John** (1838-1914), American naturalist and writer, was born in Scotland. He went to the United States in 1849, studied at the University of Wisconsin and made extensive botanical and geological excursions in Wisconsin, Indiana, Michigan and Canada. In 1868 he visited the Yosemite Valley, and studied the natural history in that locality and in the adjacent Sierra Nevada mountains. In 1876-79 he made several tours of exploration in the Northwest. While in Alaska he discovered the glacier which bears his name. His advocacy of forest preservation largely influenced the United States policy of conservation. He published *The Mountains of California* (1894), *Our National Parks* (1901), *My First Summer in the Sierra* (1911), *Story of My Boyhood and Youth* (1913).

**Muir Glacier**, a huge glacier in Alaska, at Glacier Bay, about 120 m. n.w. of Sitka. It was discovered in 1878 by John Muir, for whom it is named. It is about 3 m. wide and its surface area is about 350 sq. m.

**Mukden**, or **Moukden**, city of Manchukuo, formerly capital of Manchuria, on the main line of the South Manchuria Railway and the terminus of the Peking-Mukden line of the Chinese government railways, 435 m. n.e. of Tientsin. The railroad station is some 3 m. away from the city, in the midst of the Japanese settlement. The city is surrounded by an outer wall about 11 m. in circumference, and an inner wall of stone and brick about 40 ft. high. The space between the two walls is the residential part of the city. The streets are broad and well laid out. North and e. of the city are the tombs of the ancestors of the Manchus. Mukden is the birthplace of the Manchu dynasty when Nurhachu established himself there in 1625. During the Boxer rising, in 1900, the city was much injured by fire. After a fierce battle of 14 days' duration, the Russians were here defeated by the Japanese, who entered the city on March 10, 1905. It was a center of interest

during the Chinese-Russian difficulties in 1929; p. about 300,000.

**Mukerji, Dhan Gopal** (1890-1936), Indian author. He came to the U. S. for an education in 1910 and wrote of his struggles in India and America, *Caste and Outcast* (1923). He visited India, wrote *My Brother's Face* (1924), and returned to the U. S. to live. He wrote many fine books for children, among them *Gayneck, The Story of a Pigeon*, which won the John Newberry Medal, 1928.

**Mulatto**, a person who is born of a white father and black mother, or vice versa. In the West Indies and South America the vari-

United States, where it has become naturalized, this is the species from which most fruit-bearing varieties are derived. *M. rubra*, native to North America, is cultivated for its deep-red or black slightly acid fruit. Mulberry bark was used by the Chinese and Japanese as a material for paper-making. The paper mulberry is planted for ornament in parts of the United States.

**Mulching**, the process of applying leaves, straw, cocoanut fibre, ashes, manure, or other substance to the surface of the soil above the roots of plants, in order to keep it moist by checking evaporation, to protect the roots



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Mukden: Ancient Chinese Temple.

ous shades of hybridism are distinguished by special names, which, however, are often differently applied in different regions. Thus *creole* is a white in North America, a black in Brazil, a white and mestizo cross in Peru. But *quadroon* and *octooroon* have everywhere the same meaning—white with one-fourth and one-eighth black blood respectively.

**Mulberry**, a tree belonging to the genus *Morus* (*Urticaceae*), native to temperate and warm climates. The various species bear rather broad leaves, more or less lobed, and small flowers. Among the best known varieties is *M. alba*, from China, whose foliage is famous as a food for silkworms. In the

from the effects of frost in winter, to keep the surface of the soil loose, or to add to the soil some form of nourishment.

**Mule**, the offspring of the mare and the male ass, though it is quite justifiable to apply the term to any hybrid. The fact that mules are apparently absolutely sterile *inter se* is largely responsible for the belief that hybrids are always sterile. Though the evidence is perhaps not absolutely reliable, there is some reason to believe that the female mule may prove fertile occasionally when crossed by a stallion or a male ass. The qualities which make mules valuable are due to blended inheritance: thus they are stronger

in constitution than the horse, less liable to disease, and more easily fed, while superior in muscular strength and in bulk to the ass.

**Mule Deer** or **Blacktail**, one of the chief species of North American deer. It gets its name from its large ears. It is next in size to the wapiti and caribou among North American deer, and is found in many mountainous parts of the West.

**Mulhall, Michael George** (1836-1900), British statistician, was born in Dublin. He went to South America, and founded there the first English daily paper (the *Buenos Ayres Standard*, 1861), and wrote the first English book printed in Argentina (*Handbook of the River Plata*, 1869).

**Mulhouse**, formerly **Mülhausen**, town, France. The leading industries are cotton spinning, printing and dye works for cotton, linen, calico, wool, and silk fabrics. For eighty-three years Mulhouse was incorporated with France; it belonged to Germany from 1871 to 1918, when it was restored to France; p. 100,000.

**Mullah**, or **Mollah**, a Mahammedan judge or magistrate.

**Mullany, James Robert Madison** (1816-87), American naval officer, was born in New York City. During the Civil War he saved Fort Pickens in Pensacola Harbor from capture, and, as commander of the *Oneida*, in an encounter with the Confederate ram *Tennessee*, he won distinction.

**Mullein**, the common name of the genus *Verbascum*, belonging to the other Scrophulariaceæ. It comprises over one hundred species, of which some six are natives of England and have been naturalized in the United States. The great mullein is a roadside plant, often five feet or more in height, with woolly, flannel-like leaves, and dense spikes of yellow flowers.

**Muller, George** (1805-98), German philanthropist, was born in Prussia. At Bristol (1832) he instituted several philanthropic works, the best known of which is the orphanage at Ashleydown (1836).

**Müller, Johannes** (1801-58), German physiologist. His chief service was the systematic arrangement of physiological knowledge in the *Handbook of Human Physiology* (1833-40; Eng. trans.).

**Müller, Julius** (1801-78), German theologian. His greatest work is *Die Christliche Lehre von der Sünde* (1839; Eng. trans.), the theory of the pre-existence of souls, advanced as an explanation of original sin.

**Müller, Karl Otfried** (1797-1840), Ger-

man classical archæologist. His *Prolegomena zu einer wissenschaftlichen Mythologie* (1825; Eng. trans. 1884) showed him a pioneer in comparative mythology.

**Müller, Wilhelm** (1794-1827), German lyric poet. Many of his poems have been set to music by Schubert, and have an almost national reputation, notably, *Die schöne Müllerin* and *Winterreise*.

**Müller-Ury, Adolfo** (1864- ), Swiss-American painter. Among his best known portraits are those of Pope Pius x., Cardinal Merry del Val, President McKinley, General Grant, J. Pierpont Morgan, Senator Hanna, James J. Hill, former Emperor William II., and Chauncey M. Depew.

**Mullet**, the name given to a number of bony fishes, known as gray mullets and red mullets.

**Mulligan Letters**, a series of letters associated with a notable defence made by James G. Blaine, just before his candidacy for the Presidency (1876), which created one of the most dramatic scenes ever witnessed in the U. S. Congress.

**Mulock, Sir William** (1843-1944), Canadian statesman, was born in Bond Head, Ont. In 1896 he was appointed postmaster-general, and in the administration of that office he reflected great credit upon himself and his department. He placed the Canadian post office upon a sound financial basis, converting an annual deficit of more than half a million dollars into a surplus of \$300,000. His chief reforms were the lowering in 1899 of the domestic postal rate from three cents to two cents per ounce; the introduction of inter-imperial penny postage; the reduction in the rate of newspaper postage.

**Mulready, William** (1786-1863), Irish genre painter. His works include *The Carpenter's Shop and Kitchen*; *Fight Interrupted*; *The Sonnet*.

**Multan**, or **Mooltan**, munic. city and cantonment, Punjab, India. It has numerous ruins of mosques, tombs and shrines, the most important being the tomb of Rukn-i-alam, in the old fort; p. 84,806.

**Multiplepoinding**, a process of Scots law, similar to, but wider than, the English interpleader, by which it is determined which of two or more persons is entitled to property or in what proportions it is to be divided.

**Multiple Stars**, groups of three or more stars physically connected. Herschel perceived  $\epsilon$  Lyrae to be made up of two couples, and each has proved to be revolving, while they drift together through space.

**Multnomah Falls**, one of the numerous picturesque waterfalls on the left bank of the Columbia River, 60 miles below the Dalles.

**Mumford, Lewis** (1895- ), Am. author, born Long Island, N. Y.; published *The Story of Utopias*; *Herman Melville*; *The Brown Decades*; *Living Philosophies*; also wrote *Men Must Act*; *Faith for Living*.

**Mummius**, whose full name was **Lucius Mummius Achaicus**, was prætor at Rome in 154, and afterwards governor in Further Spain. In 146 he utterly defeated the army of the Achæan league at the isthmus of Corinth, and plundered Corinth.

**Mummy**. See **Embalming**.

**Mumps**, or **Epidemic Parotitis**, a highly contagious but not very serious epidemic disease, chiefly noticeable for the accompanying severe inflammation and enlargement about the parotid glands. It occurs most commonly among children.

**Munch, Edvard** (1863-1944), Norwegian painter. He introduced to his native land the personal interpretation to painting as opposed to realism and illusionism. His *The Sick Child* is a masterpiece of Norwegian art. His *Spring* is in the National Gallery and many of his works are at the Linde Collection at Lubeck.

**Munch, Peter Andreas** (1810-63), Norwegian author, was born in Christiania. He was a recognized authority on Scandinavian archaeology and philology. His *magnum opus*, is *Det Norske Folks Historie*.

**Münchhausen, Hieronymus Karl Friedrich, Baron** (1720-97), a German noble. The story of his adventures first appeared in Oxford in a book of 48 pages, *Baron Münchhausen's Narrative of his Marvellous Travels and Campaigns in Russia*.

**Muncie**, city, Indiana. Oil and natural gas are found in the region. Muncie is an important manufacturing center, producing glass, iron and steel, gas engines; p. 49,720.

**Munda**, a strategic Japanese air base on New Georgia Island. It was taken by U. S. troops early in August, 1943.

**Mundé, Paul Fortunatus** (1846-1902), physician, was born in Saxony. His skill in gynecology brought him a large practice, and he was obstetric physician at various hospitals in New York. For several years he edited the *American Journal of Obstetrics*.

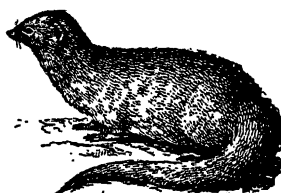
**Mundelein, George William** (1872-1939), cardinal, born in New York City. Ordained a priest in the Roman Catholic church, 1895, from 1909-15 he was auxiliary bishop of Brooklyn. After 1915 archbishop of Chi-

cago; elevated to the cardinalate in 1924.

**Mundella, Anthony John** (1825-97), English social and political reformer. He founded the first board in Great Britain for the settlement of labor trouble. By his Act of 1881 compulsory attendance at school was made universal in England and Wales.

**Mundurucus**, a tribe of South American Indians, the most numerous and powerful of all Amazonian peoples.

**Mungoos**, or **Mongoose**, the Indian name for *Herpestes griseus*, a small carnivore, allied to the civets and ichneumons. It is found in India, Malaysia, Africa, and Spain. The animal is useful in destroying rats, and was



Indian Mongoose.

on this account introduced into the West Indies, especially Jamaica, in 1872, where it multiplied rapidly and speedily became a nuisance, destructive to birds and poultry. Its introduction into the United States has been strictly prohibited.

**Munball**, borough, Pennsylvania. The Carnegie Steel Works, among the largest in the world, are located here; p. 13,900.

**Muni, Paul** (1895- ), actor, born in Austria. Started his stage career in the Yiddish Theatre in N. Y. He appeared on the English speaking stage in 1927. Since 1932 he has performed in Hollywood. He won world renown for his portrayals in *The Valiant*, *I Am a Fugitive From a Chain Gang*, *Black Fury*, *The Story of Louis Pasteur*, *The Good Earth*, and *Hudson's Bay*.

**Munich**, (Ger. *München*), town, capital of Bavaria. The royal residence, a magnificent pile, was commenced in the beginning of the 17th century, under Maximilian I. The cathedral dates from 1368. The royal library is one of the most valuable in Germany, and the picture galleries and other art collections are famous throughout the world. The Old Pinakothek houses one of the most notable collections of paintings in the world, while the New Pinakothek contains many valuable modern works, chiefly by Bavarian artists. The German Museum of Natural and Technical Sciences, the largest of its kind in the

world, was opened in 1925. Munich is also celebrated as a musical and dramatic center, being intimately associated and influenced by Wagnerian tradition, and having many theatres of high standing. The leading industry is the brewing of beer, for which there are some 40 or 50 breweries, in connection with which are many famous beergardens. Munich was founded by Henry the Lion, Duke of Saxony, in the middle of the twelfth century. Adolf Hitler's 1923 putsch, which failed dismally but gave the Nazi Party the impetus which led to its domination of Germany ten years later, was conceived in a Munich beer hall, the Burgerbrau Keller. It was there that Hitler fired a revolver shot in the air, crying: "I proclaim the new Reich!" It was in Munich in 1934 that Captain Ernst Roehm and several of his companions were executed in the great Nazi "purge." Here was held the Munich Conference of Sept. 28, 1938, at which government heads of Great Britain, France and Italy assented to the taking by Germany of the Sudetenlands from Czechoslovakia, as the price for temporary European peace. p. 828,325.

**Municipality.** In law, the term municipal corporation applies to most, if not all, subordinate local authorities having corporate powers; but more commonly the term municipal is used to mean urban communities or their local government. In the time of the Roman Empire a general system of municipalities developed, including former city-states and newly founded cities, with considerable powers of local government under the authority and protection of the empire.

**Municipal Ownership.** The local aspect of government or public ownership is commonly referred to as 'municipal ownership,' sometimes as 'municipal socialism,' 'municipal enterprise,' and 'municipal trading.' An increase in the number and importance of municipal functions may be viewed as the necessary result of the rapid and extensive process of urbanization which has taken place during the last fifty to seventy-five years. Many of these public functions are not performed on a commercial basis; it is to such as are so undertaken that the term municipal ownership particularly refers. The principal public functions conducted in this way are water supply and distribution, transportation, provision of electricity and gas for power, provision of light and heat, and of communication. More recently the provision of housing, food supply, fuel, and ice have come to be recognized as public functions and have

been undertaken by some municipalities on a commercial basis. Instances of municipal ownership and private operation, although infrequent, represent a step half way between public and private enterprise, sometimes more satisfactory than either.

**Munitions Investigation.** In April, 1934, the United States Senate appointed a Special Committee to investigate organizations engaged in manufacturing and trading in arms, and to consider the wisdom of 'creating a government monopoly in respect to the manufacture of armaments and munitions.' The findings of this committee were: 1. Private interests have circumvented the government policies expressed in arms embargoes or international treaties. 2. Bribery has been practised in armament sales. 3. Firms have sold arms simultaneously to both sides in time of war and revolutions. 4. Firms have encouraged armament races between friendly countries. 5. Firms have maintained lobbies to influence naval appropriations. 6. Arms companies in Great Britain, Germany, and the U. S. have secretly agreed on exchange of processes, and division of profits and sales territories. 7. Government agencies have encouraged sales to foreign countries.

It was revealed that contrary to the provisions of the Versailles Treaty which forbids Germany to import arms, such importations had been made through firms in Great Britain, France, and the U. S. In these cases bribery was found to have been practised. Our own government agencies had abetted these sales. The investigation further disclosed the wartime profits of leading corporations, notably the U. S. Steel Corporation, Bethlehem Steel, and the du Pont Company.

**Munkácsy, Michael** (1846-1900), Hungarian painter. His first important picture, *Last Day of a Condemned Prisoner* (1868-9) gained a medal at the Salon and established his reputation. Other pictures are *Milton Dictating 'Paradise Lost' to his Daughters* (1878), now in the New York Public Library, *Christ before Pilate* (1881), *Death of Mozart* (1884).

**Munro, David Alexander** (1848-1910), American journalist and editor, was born in Ross-shire, Scotland. He subsequently became general manager, and then editor, of *The North American Review* (1896-9). He assisted in the preparation of the last edition of Liddell and Scott's *Greek Lexicon*.

**Munro, William Bennett** (1875- ), teacher, was born in Almonte, Ont. Instructor in history and political science, Williams

College, 1901-4; instructor and later professor in Harvard College, 1904-1929; now professor in California Institute of Technology. Among his works are *The Government of the U. S.* (1919), *American Government Today* (1930).

**Munroe, Charles Edward** (1849-1938), American chemist and educator, was born in Cambridge, Mass. He was expert special agent in charge of the chemical industries of the United States for the censuses of 1900, 1905, and 1910. He invented smokeless powder.

**Munroe, Kirk** (1850-1930), American author, was born on the Mississippi River near Prairie du Chien, Wis. In 1879 he became the

American inventor and stenographic expert, was born in Oneida co., N. Y. His experience of more than thirty years as a court stenographer in New York (1857-90) led him to make a number of simplifications in stenography, which he embodied in the *Munson System*. He also invented a typesetting machine and a process for operating a typewriter by telegraph.

**Munster**, province, Ireland, comprising six counties—Clare, Cork, Kerry, Limerick, Tipperary, and Waterford—with an area of 9,318 sq. miles. In Kerry are the beautiful Killarney Lakes; p. 969,902.

**Münster**, town, Prussia. It is the seat of a bishop and has numerous mediæval build-



Munich: Left, Siegesthor; Right, Old Palace.

first editor of Harper's *Round Table*. In 1882 he removed to Dade county, Florida, and devoted himself to the writing of books for boys. Among some forty titles are *The Flamingo Feather* (1887); *Outcast Warrior* (1905); *For the Mikado* (1906).

**Munsey, Frank Andrew** (1854-1925), American publisher, was born in Mercer, Me. He began (1882) the publication, in New York City, of a juvenile weekly, *The Golden Argosy*. In 1889 appeared *Munsey's Weekly*, changed in 1891 to *Munsey's Magazine*, the first of the ten-cent magazines to attain a large circulation and a profitable advertising patronage. Munsey subsequently launched a number of other magazine ventures and acquired the ownership of various newspapers, including the *New York Mail*, *Herald*, *Press*, *Sun* and *Globe*, and *Evening Telegram*. He was also the author of a number of stories of American life, including: *Afloat in a Large City* (1887); *The Boy Broker* (1888); *Derringforth* (1894).

**Munson, James Eugene** (1835-1906),

ings, including the Gothic church of St. Lambert (fourteenth century), the Rathaus, in which, on Oct. 24, 1648, was signed the Peace of Westphalia which terminated the Thirty Years' War, the Cathedral, and the Westphalian Museum, with a fine collection of Westphalian paintings. The leading industries are the manufacture of linen and cotton goods, distilling, brewing, woodcarving, and glass-painting; p. 106,418.

**Münster, Sebastian** (1489-1552), German scholar, was born in Ingelheim. He edited the first Hebrew Bible produced in Germany; wrote a Hebrew grammar and a Chaldean grammar and dictionary; also a geography entitled *Cosmographia Universalis* (1544).

**Münsterberg, Hugo** (1863-1916), German-American psychologist, was born in Danzig. The psychological laboratory at Harvard is one result of his labors. His more important books are: *Psychology and Life* (1899); *American Traits* (1901); *Psychology and Industrial Efficiency* (1912); *The Peace and America* (1915).

**Muntjac**, small Oriental deer belonging to the genus *Cervulus*. Muntjacs are jungle animals, and haunt upland forests especially. The type form is *Cervulus muntjac*, the 'barking deer' of India.

**Münzer, Thomas** (1490-1525), religious enthusiast, was born at Stolberg in the Harz Mountains. He joined the Protestant reformers, and later (1521) founded a new sect, called by its opponents the Anabaptists. Having been expelled from several places, he settled at Mühlhausen in Thuringia, and brought about the Peasants' War, which terminated disastrously at Frankenhausen (1525).

**Muræna**, a large eel-like fish, abundant in

hangings. The ancient Egyptians, Babylonians, and Assyrians decorated the walls of their temples and other public buildings with large brilliantly colored figures of birds, men, animals, and sacred symbols. The Greeks also made extensive use of color, often applying it to their marble statues and reliefs. The Romans employed fresco painting, mosaics, and marble incrustations. Italy took the lead in the development of fresco painting in the fourteenth century through the work of Giotto, Cimabue, and their successors, exemplified at Assisi, Pisa, Florence, and Siena, culminating in the following centuries in the marvellous frescoes of Raphael and Michelangelo in the Vatican.



Mural by Boardman Robinson: R.K.O. Building, New York City.

tropical and sub-tropical seas. Most species are predaceous, and are armed with strong, pointed teeth, by means of which they seize the fish upon which they prey.

**Mural Decoration**, the art of decorating walls, as by painted surfaces, spaces carved in relief, and other methods of adornment. The practice dates from early times, as far back as 4,000 or 5,000 B.C. Frescoes are paintings in which the colors are laid on fresh plaster; encaustic paintings are those in which heat is applied; graffito is the term used to describe a design scratched on plastic and colored in sections. Other methods of mural decoration are the use of mosaic; sculpture; tiles, of which the work of della Robbia is a shining example; and the more modern wall paper, tapestry, and fabric

The earliest important decorative works in America—those by the Italian Brumidi and the German Leutze (1860-8)—are American in subject only. The native school may be said to have begun with the decoration (1876-7) of Trinity Church, New York City, by John La Farge. These were followed by the decorations of the State Capitol in Albany, N. Y., executed in 1878 by William Morris Hunt. Perhaps the most important single decorative achievement in the United States is John Singer Sargent's 'Pageant of Religions' in the Boston Public Library, containing his celebrated 'Prophets.' E. A. Abbey's series of frescoes based on the story of the Holy Grail adorns the same building. A marked impetus to mural painting was afforded by the decoration of the buildings of



the World's Fair at Chicago (1903), executed under the direction of Francis D. Millet. A large number of American decorative artists also took part in the adornment of the Congressional Library at Washington.

Among other important public buildings whose decorations were completed during the last years of the nineteenth century were the Boston State House, decorated by Simmons, Walker, and Reid; the Appellate Court House in New York City, by a number of artists, and the Baltimore Court House by Blashfield and Turner. Among recent achievements are the state houses at Harrisburg and Des Moines, and especially that of St. Paul may be mentioned. Ornate mural decoration has also become customary in the great hostleries, such as the Waldorf-Astoria, the Manhattan, and the St. Regis, in New York City. The sensational decorations for the courtyard of the Detroit Museum of Art are painted by Diego Rivera. For the art controversy over the murals of the RCA Building at Rockefeller Center, New York, see RIVERA. Later at the Communist 'New Workers School' in New York, this artist painted panels of Marx, Trotsky, Stalin, and W. J. Foster. Brangwyn and Sert were also connected with the mural painting at Rockefeller Center. 'The Epic of Culture in the New World' at Dartmouth College was painted by Orozco. Thomas Benton is regarded as the greatest American mural painter. His murals depicting Indiana history and life at A Century of Progress Exposition won for him nation-wide acclaim.

**Murano**, tn., Italy; for centuries had a reputation for Venetian glass. Its cathedral of San Donato dates from the 10th century, and has a noteworthy collection of Venetian glass; p. 5436.

**Murat, Joachim** (1767-1815), king of Naples, was born at La Bastide, in France. Napoleon rewarded him with the command of the consular guard and the hand of his youngest sister, Caroline (1800). Murat was a great cavalry leader. He commanded the French cavalry at Marengo, at Austerlitz, through the Prussian campaign, and again in Spain, and his dash and daring contributed not a little to the French victories. He had been made king of Naples by Napoleon in 1808.

**Muratori, Lodovico Antonio** (1672-1750) Italian scholar, was born at Vignola. His three great works are the *Rerum Italicarum Scriptores* (1723-1851); the *Antiquitates Italicae Medii Aevi* (1738-42); and the *Annali d'Italia* (first complete ed. 1753-56),

which is a learned and critical history of Italy from the birth of Christ down to the year 1750. The works of Muratori mark an epoch in the study of history, by reason of his scholarly use of documentary evidence.

**Murchison, Sir Roderick Impey** (1792-1871), British geologist, was born at Taradale, Ross-shire. He resolved to attack the problem of the older rocks of Wales. This resulted in the publication (1838) of *The Silurian System*, which constitutes Murchison's chief title to fame. Murchison also founded the Permian system, and he was one of the first to recognize the importance of the Devonian.

**Murder** is the unlawful killing of another with malice aforethought. Malice aforethought refers to the state of mind preceding or co-existing with the act or omission which causes death, and may mean any state of mind from a positive intention to kill some particular person out of hatred or ill-will down to that state of mind which consists in the mere knowledge that the act will probably cause the death of, or grievous bodily harm to, some person, even although such knowledge may be accompanied by a wish that death or grievous bodily harm may not be caused. Nor is it necessary that the person killed be the intended victim if there was intent to kill some one and another is actually killed. At common law and in many states it is murder to kill another while committing the crimes of arson, burglary, rape, and larceny.

Common law does not recognize degrees in murder, but in some of the states of the United States murder is divided into first, second, and third degrees. The first degree includes all cases of deliberate homicide with intent to kill, and generally the second degree includes all other cases where malice is present, but where the intent to actually kill is not clearly made out, or where there was no previous deliberation. Where three degrees are recognized the statutes vary as to the elements of the second and third degrees, and must be consulted in each state.

**Murdock, James Edward** (1811-93), American actor, born in Philadelphia. He supported Fanny Kemble in her American tour of 1833, and played comedy parts with Jefferson, Booth, and the elder Wallack.

**Murdock, or Murdoch, William** (1754-1839), Scottish engineer and inventor of coal-gas lighting, was born at Bellow Mill, Ayrshire. Murdock also invented the steam gun (1803), utilization of compressed air, iron-

cement, and made improvements in the steam-engine.

**Murex**, a genus of gasteropods, including a large number of species, found all over the world. They produce a purple dye, which in the case of certain Mediterranean species was one of the sources of Tyrian purple.

**Murfree, Mary Noailles** (1850-1922), American author, was born in Murfreesboro, Tenn. Under the name Charles Egbert Craddock she became widely known for her graphic studies of the life and people of the Tennessee mountains. Her most important books are: *In the Tennessee Mountains* (1850); *The Mystery of White-Faced Mountains and Other Stories* (1895); *The Frontiersman* (1905).

**Muriatic Acid.** See **Hydrochloric Acid**.

**Muridae**, a family of rodents, which not only includes the true rats and mice (subfamily Murinae) but also voles, lemmings, muskrats, and many others.

**Murillo, Bartholomé Estéban** (1618-82), Spanish painter, born at Seville. He rapidly attained to popularity, and in 1660 founded the Academy of Seville. His gypsy type of Madonna, his saints and children, drawn from the people, gained him wide popularity. Neither in his conception of his subject nor in the handling does he attempt complicated emotions or color-schemes; his aim is to please the eye. Great sums have been paid for his pictures. The French in 1852 paid 586,000 francs (about \$117,000) for his *Immaculate Conception* (Louvre). A few examples of his paintings are in the U. S. Among his works are *Moses striking the Rock*, *The Miracle of the Loaves and Fishes*.

**Murmansk**, seaport and province, Soviet Russia. A railroad from Petrograd, now Leningrad, was constructed to the ice-free port of Murmansk during the World War. Valuable supplies had accumulated there at the time of the Russian revolution of 1917. In 1918 an allied expedition landed to protect these stores and to aid the White Russians against the Bolsheviks.

**Murphy, Charles Francis** (1858-1924), American politician, was born in New York. In 1902 he was elected leader of the Tammany Hall organization by the executive committee. In 1903 and 1905 he conducted the Democratic campaigns which resulted in the election and re-election of George B. McClellan as mayor of New York.

**Murphy, Frank** (1893- ), New Deal politician. He was governor of Michigan throughout continuance of the outrageous sit-

down strikes of 1937 in that State, and was decisively defeated for re-election in 1938. Became U. S. attorney-general, 1939; Supreme Court justice, 1940.

**Murphy, John Francis** (1853-1921), American painter, born in Oswego, N. Y. The N. Y. Metropolitan Museum has his 'Autumn,' a picture characterized by the poetry and refinement that mark his best work.

**Murray, David** (1830-1905), American educator, was born at Bovina, N. Y. He served under the Japanese government as superintendent of schools and colleges at Tokyo, and helped to reorganize the Japanese system of education. He was secretary to the board of regents of the University of the State of New York from 1880 to 1889.

**Murray, Gilbert** (1866- ), British classical scholar and author, was born in Australia; appointed professor of Greek at Oxford (1908) and professor of poetry at Harvard (1926); chairman of League of Nations Union. An authority on Greek drama.

**Murray, James Augustus Henry** (1837-1915), English lexicographer, was born in Roxburgshire. In 1879 he undertook, for the Philological Society and Oxford University Press, the editorship of the *New English Dictionary on Historical Principles*, one of the greatest philological works in any language.

**Murray, John** (1741-1815), American clergyman, was born at Alton, England. He took part in the first American Universalist convention at Oxford, Mass., in 1785, which assumed the name of Independent Christian Universalists for the sect.

**Murray, John**, a famous British publishing house founded in 1768 by John MacMurray (1745-93). On his death he was succeeded by John Murray the second (1778-1843)—the 'Anak of publishers,' according to Lord Byron. Murray acted as publisher for Byron, Jane Austen, Irving, Crabbe, Campbell, Lyell, Moore, Borrow, Napier (*Peminsular War*), Croker (*Boswell*), Mrs. Somerville, and others. John Murray the fifth is now the senior partner of the firm.

**Murray, Sir John**, (1841-1914), British naturalist, was born in Ontario. He was one of the naturalists on the *Challenger* Expedition in 1872-6, and after assisting in the compilation of the *Scientific Results* of the expedition, in 50 vols., became editor in 1882, contributing from his own pen the narrative of the expedition and the description of the deep-sea deposits.

**Murray, Lindley** (1745-1826), American

grammarian, was born in Swatara, Pa. The first edition of his *Grammar of the English Language* (1795) was prepared for the use of a young ladies' school in York, in which he gave instruction. It was succeeded by *English Exercises*, and a *Key*, besides an *English Reader* and *Spelling Book*, all of which were widely used in England and America for many years.

**Murray, Philip** (1886- ), U. S. labor leader, born in Scotland, of Irish parentage. Worked in Scottish mines at 10, then in U. S. mines; became president of the C. I. O. in 1940.

**Musæus**, Greek grammarian, author of *Hero and Leander*, which cannot be placed earlier than the 5th century A.D. It has been often translated into English, notably by Marlowe.

**Musæus, Johann Karl August** (1735-87), German author, was born in Jena. His principal works were *Der deutsche Grandison*, a parody on Richardson's novel (1760), and *Volksmarchen der Deutschen* (1787), which has appeared in many editions both in German and English.

**Musa Ibn Nosair** (640-715), Arab conqueror of North Africa. Having formed an alliance with Count Julian, he crossed over (712) to Spain, and took Seville and other towns.

**Muscæ Volitantes**, shadows cast upon the retina, which appear to the patient as black spots moving within his eye when he looks at a bright white surface. They are frequently more in evidence during digestive disturbances, occasionally during Bright's disease, and they are more readily seen by patients with myopia.

**Muscat, Maskat, or Muskat**, seaport and capital of the independent state of Oman, Arabia. It is under British political influence, and is the residence of the sultan and of the British resident; p. 20,000.

**Muscатель, Muscadel, or Muscadine**, a strong, sweet, delicious white wine produced in Languedoc, France. The name is also applied to both red and white wines (Moscado) of Italy and other places, especially those from the muscadine grape.

**Muscatine**, city, Iowa. The fresh water pearl button industry is one of the largest in the world; p. 18,286.

**Muschelkalk**, a shelly limestone which constitutes the middle subdivision of the Triassic system in Europe.

**Muscles**, the organs of motion, consist of bundles or fasciculi of parallel reddish con-

tractile fibres. Voluntary muscles are under the control of the will, and their fibres exhibit a cylindrical form, with minute transverse stripes or striæ. The bundles of fibres are bound together by connective tissue, which also forms a sheath for the whole muscle. Each fibre has a membranous envelope which is blended with the tissues of the tendon. Within this investment lie the sarcous or true muscular elements. The involuntary muscles are found chiefly in the walls of the hollow viscera, such as the bladder, the blood-vessels, and the intestine. Their fibres are spindle-shaped and non-striated. They are generally bound into flattened bundles by a cement substance and ordinary areolar tissue. One great involuntary muscle, the heart, is composed of striped muscular tissue, which differs in some respects from that of the voluntary muscles. All muscles are abundantly supplied with capillaries which run between and with nerves which terminate in the fibres. The normal stimulus is nervous, but the muscles may also be made to contract by electrical stimulation, by a pinch, or by a blow. After death the muscles lose their elasticity and their contractility, and become rigid through con-  
gelation of their myosine.

As a result of prolonged or repeated use, both voluntary and involuntary muscles increase enormously in size through the formation of new fibres. Disuse, on the other hand, and loss of nerve supply lead to atrophy and diminution of the muscle substance. Muscles are liable to ruptures and to wounds. The cut or torn ends need to be approximated by sutures, and the parts must be kept at rest by suitable splints.

**Muscle Shoals Project**, a project, undertaken by the U. S. Government in 1916, for the erection of nitrate plants for the production of compounds used in explosive manufacture. The project was located at Muscle Shoals, on the Tennessee River, in the northern part of Alabama, because of the excellent waterpower facilities in that region. With the termination of the Great War, in 1918, it was considered unwise to progress with the work under governmental control, and the plant, though a potential resource for war purposes, thereafter lay idle, awaiting the decision of Congress as to its financing and future administration. The Tennessee Valley Authority Act of 1933 provided for the national defense by creating a corporation for the operation of the Muscle Shoals properties.

**Muses**, in ancient Greek mythology, goddesses who were the special patronesses of the various forms of literature. They are usually said to have been the daughters of Zeus and Mnemosyne. Hesiod first fixed their number at nine: Clio, the muse of history; Euterpe, the muse of lyric poetry; Thalia, the muse of comedy and other merry verse; Melpomene, the muse of tragedy; Terpsichore, the muse of choric dance and song; Erato, the muse of love poetry; Polyhymnia, the muse of the sacred hymn; Urania, the muse of astronomy; Calliope, the muse of epic poetry. From Thessaly the worship of the muses spread to Bœotia, where Mt. Helicon was especially sacred to them. Mt. Parnassus, too, in Phocis, was one of their haunts.

**Museum**, the name originally applied to a temple of the Muses, later used in connection with any building devoted to science, learning, and fine art, as the *Museum* in Alexandria, and subsequently, as at present, restricted to institutions for the preservation and exhibition of works of art or specimens of natural history. Museums of the United States are of comparatively recent origin, but their growth has been phenomenal. While they cannot vie with the collections of the Old World, in the domain of the fine arts, except in modern sculpture and painting, in the natural sciences the best museums of America bear comparison with those of Europe.

The first museum of consequence in the United States was a development of the Smithsonian Institution in Washington. Among art museums, the first in rank is the Metropolitan Museum of Art, New York City, incorporated in 1870. The contents include Egyptian and other ancient antiquities, the largest collection of Cypriote antiquities in the world, a fine collection of paintings (particularly rich in Italian and Dutch works), collections of ancient and modern sculpture, of the decorative arts, of arms and armor, and other art objects. Second stands the Boston Museum of Fine Arts, known particularly for the arrangement of its treasures. Its collection of Japanese art is considered the finest in the world. It has important collections of Egyptian and classical antiquities, porcelains and textiles, and many examples of modern painting, as well as a collection of 60,000 prints. It also maintains a school of art. The Art Institute of Chicago, organized in 1879, has a valuable collection of paintings, sculpture, and other objects of art, and maintains the largest and most comprehensive art school in America. Other important American

museums of art are the Worcester Art Museum; the collection of the Pennsylvania Academy of Fine Arts; the Wilstach Collection of Philadelphia; the Department of Fine Arts of the Carnegie Institute at Pittsburgh, Pa.; the Walters Gallery of Baltimore; the Corcoran Gallery of Washington; the Albright Art Gallery of Buffalo; the Cincinnati Museum; the Cleveland Museum of Art; the City Art Museum of St. Louis; the Golden Gate Museum of San Francisco and the San Francisco Institute of Art. The Brooklyn Institute of Arts and Sciences, maintained by the city of New York, is devoted to natural sciences as well as to art. The Museum of the City of New York, recently opened, has exhibitions of the chronological development of the various phases of New York life, from earliest times to the present. Among the collections are the topographical history of New York, Manners and Customs, Transportation, Architecture, Banking and the Stock Exchange, Newspapers, the Theatre and Sports, Models of Historical Events, etc.

Among natural history museums, the American Museum of Natural History in New York City is notable. It has departments of anthropology, geology, palæontology, and zoology, and has sent out many important expeditions. The Peabody Museum of American archæology and ethnology, belonging to Harvard University, is especially rich in ethnological material pertaining to the American Indian. The Department of the Museum, Carnegie Institute, Pittsburgh, is strong in anthropology, palæontology, and zoology. The Field Museum of Natural History in Chicago was founded by Marshall Field. Its departments of American archæology and botany are particularly fine, and it sends out numerous expeditions.

Other museums are maintained by various historical, local, and patriotic societies throughout the country, such as the New York Historical Society, the Pennsylvania Historical Society at Philadelphia, and the Chicago Historical Society. Many universities and colleges also have museums. Mention may also be made of such museums as those of the New York Botanical Gardens, the Zoölogical Gardens in Bronx Park, and the New York Aquarium, all maintained by the city, the Museum of the Hispanic Society of America, and the Museum of the American Indian, also located in New York, and similar institutions throughout the country. Among the great museums of the world are the British Museum; the South Kensington Museum;

the Louvre, Paris; the Museums of the Vatican; the Hermitage, Leningrad; the Prado, Madrid; the Uffizi, Florence.

**Mushrooms**, a group of fungi of the family Hymenomycetaceæ, many of which are edible. They occur in almost all parts of the world, growing wild in woods, meadows, and pastures. The edible varieties are extensively cultivated for the table, usually under cover. The best known of the true mushrooms is the Common Mushroom (*Agaricus campestris*). Other popular edible varieties are the Horse Mushroom; three members of the genus *Coprinus*—Ink Caps, Shaggy Manes, and the Glistening *Coprinus*; the Parasol Mushroom; Fairy Ring Mushrooms. As food, mushrooms contain about 89 per cent. water and are valuable largely for their protein content. Mushrooms are easily grown in cellars or caves where beds of manure are prepared, where the temperature is held about 54 F., and where sufficient moisture is provided.

**Music**. A sound, to be material for musical use, must have such regularity of vibration as to be recognizable as individual. Such a sound, as opposed to irregular vibrations, producing what is known as noise, is called a tone and is the smallest unit in the science and art of music. Most tones, however, are really composites, as every vibrating body tends to produce a series of tones made up of a fundamental tone, with its specific name, as c, c, etc., which determines the pitch, and certain higher tones called overtones, or upper partials.

Three groups of instruments were devised by primitive man—wind instruments, with numerous varieties of flutes and flageolets made of reeds, grasses, wood, bone, stone, etc.; percussive instruments, including clappers, castanets of shell or metal, gongs of various materials, and drums in infinite variety; stringed instruments, from the most primitive harps, made like a bow, to more advanced inventions employing resonance boxes and necks.

The growth of systems of notation in Europe required many centuries. The Greeks contented themselves with a simple method of indicating tones by letters and other similar characters, some inverted, some placed on their sides. Two sets were in use, one for vocal and one for instrumental music. At times duration was indicated by small marks, and there was a sign for a rest. Certain slight improvements were made by the Romans. From the 8th century neumes—musical shorthand signs—placed above the words, came in-

to use, though with much variation in the treatment of the slanting lines, curves, points, and dashes. Lines—one or two—were in use by the 10th century, giving more definite location for tones. Thus the modern staff had its beginning. Subsequently other lines were added, and letters were given to indicate tones, especially c, g and f. From the Gothic character of these letters the modern clefs are derived.

Music in the hands of the Greeks took on a dignity and scientific elaborateness hitherto unknown. While there are but few examples of ancient Greek melodies, we know that music and poetry were used almost inseparably. The instruments most used were the *lyra* and *kithara*. The 7th century B.C. saw the beginning of acoustical research, Pythagoras (582-c. 507 B.C.) being the first important discoverer of the laws of sound. A tone-system was built up on the units, the octave and the tetrachord (four tones within the interval of a fourth). Contrary to the present method of conceiving scales and intervals, the Greeks reckoned downward. By variously dividing the tetrachord, three types of series were created—the diatonic, chromatic, and enharmonic, the first of which was considered most important. These series may be given as E, D, C, B. The diatonic series within the tetrachord was subject to various rearrangements by different placing of the half-tone, giving rise to 'modes' or 'species.' By joining two similar tetrachords together and, when necessary, adding one step, an octave was created.

Seven 'species' or 'modes' were recognized, the difference of effect being caused by the position of the half-tones or half-steps. This may be visualized by using only the white keys of the piano. By playing the scale (downward) from E to E on the white keys, the Dorian mode is illustrated; from D to D, the Phrygian, etc. These arrangements of whole and half-tones established norms that were long used in ecclesiastical music through the spread of Roman influence; they are seen in much of the Russian music and later in the work of Debussy and others among the moderns. Of the seven original modes, two much used survive in modern music—the Lydian, our major, and the Hypodorian, of which our minor is a variant.

**Early Church Music**.—The early Christians naturally turned to music as an aid to religion, advances in style being traceable from about the 4th century. Greek unison melody was made the basis of the Gregorian style,

characterized by absence of fixed rhythm—following, as it did, prose texts—austerity, use of modes, and a formal but effective union of text and music. Eight modes, built upon the Greek prototypes, but differently named, were used with some variation, by the year 1000, and others were later added. Slowly the pure style gave way to more floridness, and tones foreign to the pure scales crept in. The 13th century saw early successful attempts at polyphonic (many-voiced) writing. In the works of several writers of the 15th century contrapuntal skill was developed to a point of astounding intricacy. Progress in polyphonic music was meanwhile being made in Italy. One of the two main seats was at Venice. At Rome, the other center, the Papal Chapel encouraged the best writers. The long series culminated in Palestrina (d. 1594), whose works show the highest possible development of nobility of style, appropriateness of music to text, the proper adjustment of the intellectual to the emotional element—all within the limits prescribed by the ideal expression required by the Roman ritual.

*Early Secular Music.*—Meanwhile there were movements to give to the laity music more worldly, of more warmth and charm. The Troubadours appeared in Southeastern France after 1100 and were prominent until the 13th century. In Northern France the Trouvères pursued some of the devices of the Troubadours, though certain important differences existed. From France the songs made their way easily to England and the Netherlands. In Germany a parallel movement occurred in the activities of the Minnesinger and the Meistersinger.

*Musical Instruments.*—In the 16th century, especially in the latter half, music for instruments came to be recognized as worthy of serious attention; the desire for more body in accompaniments led to efforts toward the perfecting of instruments, and the creation of the opera, about the beginning of the 17th century, played an important part in this respect. Instruments in use at the beginning of the 16th century were of two main classes—keyboard and portable stringed instruments. Of the latter, the lute was most highly considered for its possible concerted effects, tending toward modern harmony—a welcome relief from the contrapuntal type. It was much in favor until the 18th century. The guitar and mandolin are its modern derivatives. The viol—played with a bow—appealed because of its more eloquent singing tone. Several varieties were developed, the

most important of which was the violin in its early form. The crowning workmanship came from Stradivari (d. 1737), pupil of one of the earlier and famous Amati family at Cremona, and from the Guarneri family, especially Giuseppe (d. c. 1745).

The modern keyboard was practically established by the 16th century. Using the long-understood principle of the lever, organs and stringed keyboard instruments came into more developed form. Among the precursors of the pianoforte was the clavichord, known as early as the 14th century and still made up to about 1800. Another precursor of the pianoforte was the harpsichord. To Cristofori (d. 1731) is due the credit of inventing the modern pianoforte. The growth of the organ occupied several centuries. Other instruments of importance in modern music are the clarinet; the flute; the oboe. Horns of various types—French horns, trombones, etc.—were similarly derived from older forms and have undergone great improvements since the creation of the modern symphony orchestra.

The great outstanding name of the contrapuntalists—indeed one of the important names of all groups in musical history—is J. S. Bach (1685-1750). To Bach is due credit for extension of keyboard technique, as he advocated the use of all fingers instead of the middle three. His works for the clavichord include the famous *Well-Tempered Clavichord* (forty-eight preludes and fugues in all the keys, a pianistic thesaurus), twelve suites, inventions, and many concertos for one or more clavier, containing suggestions of the sonata form. The chamber music list is also a long one—sonatas and concertos for violin with orchestra, and for flute, violin, and viola da gamba with clavier, and many orchestral overtures. Besides a large number of smaller vocal works, including secular as well as sacred cantatas, Bach's compositions include the Five Passions, two Magnificats, and five large masses.

A contemporary of Bach was Handel (1685-1759). His operatic works showed early Italian influences, but in his oratorios—about twenty in number—his commanding genius is evident. To Handel we owe the modern oratorio, and his influence upon choral music in England, where he produced a long list of works, has been very great. *The Messiah* (1742) has held its place as the foremost of Handel's oratorios.

In the folk song the idea of a second theme, in contrast with the principal theme,

had presented itself in the interest of variety. The operatic aria developed this idea, and the three-part song form was established. Out of these elements emerged the sonata, tentatively in the hands of Scarlatti (1685-1757), Bach (in his concertos), and Philipp Emanuel Bach (1714-88), who bequeathed to Haydn a form ready for significant developments. Haydn, by able combination of the materials at hand, established the sonata form, in which a very large part of musical literature is cast—sonatas for pianoforte, solo stringed instruments, chamber music, including trios, quartets, etc., and the symphony (sonata for orchestra). Haydn left 125 symphonies, 30 trios, and 77 quartets, besides many other works for various combinations, including voices. His work in fixing the sonata-form and in orchestral improvements justifies his name 'father of the symphony and the quartet.'

The line of development was unbroken by the prolific activity of Mozart (1756-91), master of melody, form, and grace. One of the world's greatest prodigies in any field, he composed at a very early age, from 1766 producing an astonishing series of compositions. He produced over a thousand works, including symphonies, chamber music, sacred and secular choral music, works for solo instruments, and a long list of operas. Of the latter, *Don Giovanni* (1787) and *Die Zauberflöte* (1791) should be mentioned. Among the symphonies are the great *Jupiter* in C and the G minor.

In Beethoven (1770-1827) classical music came to its highest point and romantic music had its real inception. He conceived music as a means of expressing the throbbing emotions of mankind. Beginning as a strict classicist, he worked his way into greater and greater freedom by extension of form and treatment of thematic and harmonic materials, until, in his last period, there was at work a genius bound by inadequate forms he was trying to escape. He became essentially a romanticist by his insistence upon the function of music as a personal, not a formal, utterance, even though classical forms were used. Beethoven's works for the pianoforte include thirty-two sonatas for two hands, one for four hands, and many smaller pieces, five concertos, eight trios, and three quartets. The violin list contains the nine sonatas and the great concerto. Sixteen quartets and a large number of other ensemble works are in the chamber music class. There are nine symphonies, the last called the 'Choral,' as

in the last movement Beethoven employed voices; twelve overtures, *Egmont* and the three *Leonore*, being among the greatest in the literature. Works for the voice include, among others, the opera *Fidelio*, an oratorio, and two masses.

Great German symphonists since Beethoven are Spohr (1784-1859), Schubert (1797-1828), Mendelssohn (1809-47), Schumann (1810-56), and Brahms (1833-97). In Schubert the romantic element was predominant. Prolific to the extreme, he wrote over 600 songs, 6 masses, many dramatic works, 20 string quartets, many works for the piano, and 10 symphonies, the most famous being the 'Unfinished' in B minor and the C major, the last a monument of lyricism. Schumann, another romantic, added richly to the song literature of the last century, producing nearly 250 songs. In his *Carnaval*, *Fantasiestücke*, and *Fantasie* in C, as in many other works for the pianoforte, he made use of striking rhythms, individual, pictorial themes, and harmonic novelties, all to reproduce visions fantastic but full of charm and poetry.

Other song writers who should be noted are Franz (1815-92), Wolf (1860-1903), Cornelius (1824-74), Brahms (1833-97), and Loewe (1796-1868). Mendelssohn (1809-47) carried on the romantic development, facetiously blending the classical with the romantic style. He wrote 4 symphonies, 7 overtures, a violin concerto, much chamber music, and many choral works and pianoforte compositions. In Brahms (1833-97) the classical school is said to have ended. To one group he appeared a reactionary, since he adhered so strictly to the older forms and, withal, brought an academic solidity to his writing; by another he was looked upon as a romanticist, using the classical forms as a vehicle of more than formal musical thought. His songs have a sober earnestness and fervor that have put him in the ranks of the great song writers. In addition to a large number of pianoforte works (solos in sonata forms, intermezzi, capricci, and concertos), he produced four great symphonies, overtures, and the *German Requiem*. To violin literature he contributed sonatas and a concerto which ranks with the world's greatest.

To Liszt (1811-86) was due the creation of the new orchestral form, the symphonic poem. Among his important works are the poems *Tasso*, *Orpheus*, *The Preludes*, and *Mazeppa*. As conductor, pianoforte virtuoso, and champion of the neglected, especially among the 'radicals' of the day, his influence

was enormous. In the symphonic field, as well as in the opera, the most stupendous German compositions after Brahms came from Richard Strauss (1864- ). This unusually bold writer produced a series of works which, for daring of conception and brilliance of execution, command tremendous interest if not always musical approval. With an amazing orchestral technique, an abundance of ideas of tonal coloring, and especially a sense of humor, he stands at the head of the German school today. Besides many songs of great beauty, he has written a series of tone-poems, including *Don Juan*, *Tod und Verklärung*, and the operas *Feuersnot* and *Salome*. For Wagner's important contribution to German music, see OPERA.

While English music began with and has been predominantly concerned with the choral side, this interest did not entirely preclude the production of instrumental music. The madrigal, a light and pleasing contrapuntal form of secular music, already created in Italy, came to hold great interest for the English writers. Morley (1557-c. 1602) and Gibbons (1583-1625) excelled in this form. In the latter part of the 19th century, a group of composers appeared, including Sullivan, noted chiefly for his gay and sparkling comic-operas, though also the writer of serious opera, and orchestral music; Parry with many symphonies; Stanford; and Elgar.

In Italy the impetus given to use of instruments made itself felt increasingly as the 17th century progressed. About that time the 'sonata' (a piece to be 'sounded,' as opposed to the 'cantata,' one to be sung) came into general use. The violinistic traditions of Corelli influenced Pugnani (d. 1798) and his pupil Viotti (1753-1824).

Domenico Scarlatti (1685-1757), son of the famous opera-writer, was equally important in the field of harpsichord music, rivalling Handel in virtuosity. His numerous works are important in their freedom from contrapuntal elements, and in their tendency toward the distinctly modern homophonic form.

In France the music of the 16th century, apart from the secular types of the Troubadours and Trouveres noted above, was strongly influenced by the Netherland composers. In the French works there was an advance in structural clarity in chamber music, on which the ballet and opera styles made an impression. In the operatic arena Gluck had entered, and a movement was started, that led to a rehabilitation of opera when

the *opéra comique* was beginning to engage serious attention. Méhul (1763-1817) and Cherubini (1760-1842) were among those who carried on the Gluck traditions. Cherubini was in the group of the best opera writers. Church music occupied him, however, as well as opera, and his greatest works are his masses and the *Requiem* in C minor.

Chopin (1810-49) was the greatest genius to make use of the improved pianoforte. Psychologically his music runs from the most morbid to the febrilely fiery. In these two extremes his mixture of racial predilections is seen at work. The *Nocturnes* and some of the *Preludes* exhibit the former mood, while the *Polonaises* and many *Etudes* are examples of the latter. His *Sonatas* in B minor and B b minor are among the best pianistic literature, constantly heard. Other works equally well known are the *Scherzos*, *Ballades*, *Impromptus*, and *Bercesse*. In the orchestral field, Berlioz (1803-69) wielded equally great influence. He studied all groups of instruments with the idea of utilizing to the fullest degree their special capacities. Contemporaries of importance in the orchestral field were Reber (1807-80); David (1810-1876), composer of *Le désert*; Habeneck (1781-1849), founder of the Conservatoire concerts in 1806; and Padeloup (1819-87), who began another series in 1851. Gounod (1818-93) was active in the field of sacred music, though it is upon his operas, notably *Faust*, that his fame rests. Saint Saëns (1835-1921) was long the commanding figure in French music. His very wide list contains many operas, of which *Samson et Dalila* is the most famous. Bizet (1838-75) showed much talent in orchestration and vivid characterization, along with a tense dramatic strength. His outstanding achievement is *Carmen*. Chabrier (1841-94) produced several works that show originality. A really great figure is seen in Franck (1822-90), a Belgian, who was closely identified with French music during his long residence in Paris. A faithful pupil of Franck, and his biographer, is d'Indy. Charpentier (1860- ) has been widely popular in a few works in which he has tried to translate social problems into music, as in the opera *Louise*.

Debussy (1862-1918) is undoubtedly one of the great geniuses of modern times. He soon broke with tradition, however, and a new spirit crept into his work that became, to the conventional, more and more obviously that of a heretical iconoclast. In extension of form, in development of harmonic impli-



cations, in pictorial conveyals of evanescent, shimmering moods—still air and water, the floating clouds—he evolved a style of musical suggestion that has greatly enriched our literature. He was aided in his development by close and sympathetic association with the famous group of impressionists (Mallarmé and others), who helped him crystallize what was first an inchoately felt desire for more direct, poignant expression of fleeting impressions and feelings than had before been achieved by the most romantic of the romantic composers. His orchestral prelude *L'après midi d'un faune* (1894) was one of the startling and new works of the century. Russian music is a mixture of elements, prominent among which are the Greek, the Oriental, Persian, Arabian, and Far Eastern. Much of its weirdness is due to these Eastern influences, which brought to Western peoples strange intervals, runs, and jumps. From the Greek music, introduced through the Church, modal influences were derived. The Italian style ruled, however, until Glinka (1804-57), preceded by Verstovsky (1799-1862), made his great contributions in works that were 'not only in the subject, but the music, too, Russian.' *A Life for the Tsar* (Petrograd, 1836) and *Russian and Ludmilla* (Petrograd, 1842) are imbued with national spirit and expressed in Russian folk style. A school was thus created which has affected not only opera but other forms of composition. Probably the most widely known composer is Tchaikowsky (1840-93). His use of folk material is sometimes notable, but not as much as his grasp of the psychological extremes of gaiety and gloom prevalent in the Russian mind and arts. He conducted many of his own works in Russia, Western Europe and America. The Neo-Russian movement was headed by Balakirev (1837-1910), an ardent admirer of Glinka. As leader of 'The Five'—of whom the others were Cui, Mussorgsky, Rimsky-Korsakov, and Borodin—his place is noteworthy. Cui (1835-1918) was important as a result of his numerous writings and his concerts in Western Europe. Borodin (1834-87) developed folk material less than his associates and presented oriental features that give his work a bizarre touch, noticeable in the symphonic poem *On the Steppes* and the remarkable opera *Prince Igor*. Mussorgsky (1839-81) presented a vigorous opposition to the older æsthetics of music. His great work is the opera *Boris Godunov*, in which epic, nationalistic, lyrical, and dramatic elements are profusely present. Glazounov (1865- ) has

been very prolific in the orchestral field, at first distinctly Russian in quality but later showing marked German structural influences. The prolific Arensky (1861-1906) was more French than Russian. Rimsky-Korsakov (1844-1908) occupies a highly important place in the development of Russian music. Gifted with a versatility and power of self-discipline, he achieved by late study a mastery of technical details in a remarkable way. He could be extremely nationalistic and equally exotic, as his oriental music shows. In the operas *Sadko*, *The Snow Maiden*, and *The Golden Cockerel* a rare combination of theatrical and musical talents is seen. Scriabin (1872-1915) was the first of a modern group, and, as he was closely associated with the group now presented, should be mentioned here, though his influence is very strong today. Art for him was a far bigger thing than an expression in any one form. His metaphysical idea included the use of color and even perfumes in his ideal conception. In *Prometheus* he called into play the use of colored lights, with unconvincing effect, but there are in his orchestral works a mystical power and a high imaginative quality that find expression—free, bold, and spontaneous utterance in which the technical resources are those of an undoubted master.

Music in America has been a real force less than a hundred years. The New York Philharmonic was founded in 1842, and has contributed tremendously to the education of concert-goers. New York has a bewildering amount of music, attracting not only the tried artists but the ever-increasing number of *débutants*. Here also opera is mounted at the Metropolitan Opera House in lavish fashion, with many of the world's greatest singers on the roster. Composition has not kept pace in quality with the interpretative side. MacDowell (1861-1908) is considered the most gifted of the American composers. He wrote less in the larger than in the smaller forms—pianoforte works full of individuality, structural clarity, and harmony. A pictorial element is frequently met. Among his other compositions are symphonic poems, 2 pianoforte concertos, many choruses and solo-songs. A long list of more academic yet gifted composers could be given, including Foote, Chadwick, Kelley, Parker, and others. A notable list of critical and historical writers have done much to disseminate knowledge and improve taste. Among later composers the late Victor Herbert and Reginald de Koven are outstanding in the field of light opera; John Alden Carpenter, Deems Taylor, and Louis Gruenberg

are noteworthy as composers of grand opera.

A form of music that has created a great amount of discussion and dissension is jazz, a product exclusively American. It is a combination of the older 'rag-time,' in which syncopation is the principal feature, and the negro 'blues' music, which is full of sliding intonation. But to these elements jazz, the real effects of which are dependent upon an orchestra, has added two equally important elements—a real polyphonic treatment and novel color effects, the latter due largely to the preponderance of the saxophone in various sizes. It is causing a widespread interest in instrumental timbre effects.

Within the last 30 years there has been a development of the harmonic side of music unknown in all music history, as the experimentalism of a scientific age has invaded the musical field. Debussy's methods, already discussed, have been followed by a host of imitators, but certain French composers—Ravel (1875- ), Dukas (1865- ), Schmitt (1870- ), and others—have shown marked individuality. During the nineties and perhaps the first ten years of the present century harmonies were evolved that, after the first period during which they seemed outside the pale, are now clearly seen as logical developments of earlier systems. Consecutives—fifths, sevenths, ninths—not only have been justified by their artistic use but by the writings of some theorists. In Russia Scriabin (1872-1915) derived certain chords from the overtone series—the source of the traditional major triad, which is the foundation of classical harmony—and proceeded to build compositions upon them. To such harmonic novelties were added by many writers the revived use of modal scales or of modal effects—which have seemingly done away with tonality. Dissonances and the lack of easily recognizable tonal centers have done much to obscure the merits of many fine works of the last 15 years.

The modern desire in composition is to avoid the emotional and associational element in music and to concentrate more upon the direct physical impression produced by musical sounds. In extreme modern music, melody, polyphony and structure have not been revolutionized but simply banished as utterly worthless.

Igor Stravinsky, Russian (1882- ), whose use of dissonance is an art in itself, undoubtedly constitutes an era in the history of music; though critical opinion of his work is much divided. The dissolution of fixed

tonality had its first definite expression in Schoenberg's 3 pianoforte pieces op. 11 (1909). This style of composing, without conscious reference to any scale or tonic, called atonality, involves a new scale. This has no chromatics, but divides the octave into twelve perfectly even parts. Each note exists by its own right and thus gains the function of a dominant, so the predominance of the dominant and tonic of the older composition is lost, and new laws must be discovered. Milhaud established the use of polytonality, which is the simultaneous use of different tonalities. Honegger is best known by his orchestral score, *Pacific 231*. Bela Bartok makes use of dissonant harmonies, which, though original are based on ancient modes and a Magyar scale of five tones. Other noteworthy modern composers include Prokofieff, Ravel, Holst, de Falla, Kodaly, Hindemith, Antheil, Malipiero, etc. These and other modernists believe they are simplifying music.

The modern English school bridges the old and the new. The intellectual aspect of music has not yet taken the place of melody, but modern English music though more expressive than the Continental is not sentimental as in the past. The outstanding contemporary English composer is Vaughn Williams.

The early 1940's witnessed a renaissance of music in the Americas, with a growing interest in American music and an increase in music centers.

**Musical Comedy**, a light form of theatrical entertainment which in the last 40 years has become an institution in America. From crude beginnings in which the older burlesque and vaudeville influences were strong, advances have been made in contents and methods of presentation that account for the great popularity in which it is now held. Today the *revue* holds the first place in this type of amusement. Notable composers of this form of music are Gershwin, Irving Berlin, Jerome Kern and Arthur Schwartz.

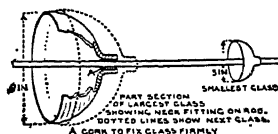
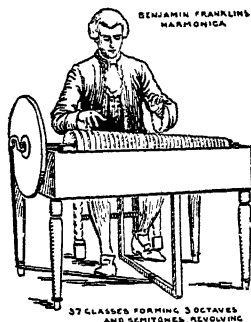
**Musical Glasses**, a musical instrument consisting of a set of glasses of equal size containing water, and played with the moistened fingers, the height of the note being proportional to the quantity of water.

**Music Box**, an automatic instrument developed from the musical snuff-box of the 18th century. The sounds are generated by the vibrating teeth of a steel comb. A single cylinder may be 'noted' to play as many as 36 tunes, the change from one to another being produced by altering the position of the cylinder

so as to bring a different series of pins into action.

**Musk**, an important element in many compounded perfumes, mainly obtained from the musk deer.

**Musk** (*Mimulus moschatus*), a little woolly-leaved plant, bearing small yellow flowers throughout summer and autumn, yielding a characteristic musky fragrance.



Benjamin Franklin's Development of the Musical Glasses.

**Muskallunge** (*Esox masquinongy*), a fresh-water fish belonging to the pike and pickerel family, found in the Great Lakes of North America, the Upper St. Lawrence River, and in Canada n. of the Great Lakes. It is dark gray in color, with black spots, and reaches a length of 8 ft. and a weight of 100 pounds.



Musk Deer.

**Musk Deer** (*Moschus moschiferous*), a member of the deer family so differing from

the other members as to be regarded as belonging to a special sub-family. It has certain peculiarities not present in other deer; there are no antlers in either sex; and the upper canine teeth are long, projecting downward and forming tusks in the male. The animal is small, somewhat clumsily built, with long legs, large ears, and a short tail. The male has a sac-like gland in the skin of the abdomen which yields the musk of commerce. Musk deer are found in Eastern and Central Asia as far n. as Siberia, generally alone or in pairs in the mountains.

**Muskegon**, city, Michigan, county seat of Muskegon co., 4 m. from Lake Michigan, on Muskegon Lake. It is an important manufacturing city, as well as a summer resort; p. 47,697.

**Muskegon River**, Michigan, rises in Roscommon co., in Houghton Lake, and follows a southwesterly course of about 200 m. to Lake Michigan, which it enters by an estuary about 2 m. wide, known as Muskegon Lake.

**Musk Glands**, glands present in many mammals, more especially the social forms, producing a strong-smelling substance, by means of which the individuals of the same species recognize one another.

**Muskhogeans**, or **Creeks**, one of the great linguistic divisions of the North American Indians. Most of the surviving members of the confederacy have been settled on reservations in Oklahoma.

**Muskogee**, city, Creek Nation, Oklahoma, county seat of Muskogee co. Muskogee was the headquarters of the Federal Government for the Indian Territory. Coal, gas, and oil occur in the district. It is the seat of St. Joseph's College and Bacone University (Baptist); p. 32,332.

**Muskoka**, lake region, of Ontario, Canada, e. of Georgian Bay (Lake Huron), famous for the beauty of its lakes, falls, and forests.

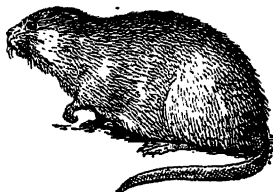


Musk Ox.

**Musk Ox** (*Ovibos moschatus*), an Arctic animal allied to certain Asiatic goat-antelopes, now limited to the Arctic parts of the western hemisphere e. of the Mackenzie River, but once ranging throughout the greater part of

the North Temperate zone. The hair is thick and so long that it practically conceals the ears and tail, and being curly on the back, forms there a thick mat, almost like a hump.

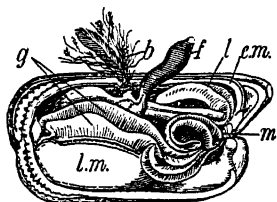
**Muskrat**, or **Musquash** (*Fiber zibethicus*), a North American aquatic rodent allied to the voles and meadow mice. The fur is dark brown, gray beneath, and is thick and soft, resembling beaver. The secretion from which the animals derive their name is produced by a large gland found in both sexes in the groin.



Muskrat.

**Muslin**, a cotton fabric probably so called because first made at Mosul in Kurdistan. It was first worn in England in 1670.

**Mussel**, the name given to a number of marine and fresh-water molluscs. *Marine mussels* belong to the family Mytilidæ. They are abundant on all temperate shores, where



Structure of Mussel.

g, Gills; b, Byssus; f, Foot, l, Lips; m, Mouth; e, m, Edge of Mantle; l, m, Lobe of Mantle.

they hang in masses on wharfing and driftwood, to which they attach themselves by a tuft of long, tough, fibrous threads, known as the byssus. The common edible mussel (*M. edulis*) is abundant on the shores of North America and Europe. Acres of them are found at low tide on the mud flats of estuarine rivers. *Fresh-water mussels* belong to the family Unionidæ.

**Musset, Alfred de** (1810-57), French poet, dramatist and novelist, while attending the Collège Henri Quatre, began to write poetry, the quality of which so charmed Victor Hugo, that he invited the young poet to join the *Cénacle*. He achieved an enviable reputa-

tion with his charming pieces, *La coupe et les lèvres*, *A quoi rêvent les jeunes filles*, and his fine poem *Namouna*, all included in the volume *Le spectacle dans un fauteuil* (1832). At this point came his fateful *liaison* with 'George Sand.' After a short period in Paris the two left for Italy, where they soon separated, the poet returning to Paris an embittered and disappointed man. In 1835 appeared his *Confessions d'un enfant du siècle*. Though the last 16 years of his life were a prolonged struggle with disease his *Nouvelles* and *Contes* contain some of the most exquisite pieces in French literature.

**Mussolini, Benito** (1884-1945), Italian statesman, creator and leader of the Fascisti, then Premier of Italy (October 1922-1943), was born in Predappio, near Forlì, in the Romagna. At the election of 1909 he smashed a ballot box, was tried and convicted, but escaped to the Italian-speaking canton of Ticino in Switzerland. He made himself unpopular with the authorities by preaching Socialism and Irredentism. He was expelled from Switzerland and went to France, where he came in contact with French Socialist leaders, like Jaurès and Hervé, whose Internationalism he opposed with Nationalism. Taking advantage of the amnesty of 1910, he returned to Forlì and became editor of the official Socialist organ, *Avanti!*, at Milan. His pronounced Interventionism dismayed the pacifist Socialists and he was expelled from the party. In order to spread his own views, he started the *Popolo d'Italia*. He went to the front as corporal of Bersaglieri, was wounded, and decorated. His convalescence gave him the opportunity for much reading and meditation. His paper became uncompromisingly nationalistic and vociferously patriotic. He invoked the patriotism of the old Romans, and used the 'fasces' of the Lictors as a symbol of his idea. He organized the Fascismo movement and by organized force against militant Communism, sought to arouse the people to a sense of the Soviet danger. Henceforth, his career is the history of the Fascismo. At Milan, on Oct. 7, 1922, he said in a speech: 'There are two Governments: The fictional directed by Facta (the Premier) and the real directed by the Fascisti. The first should give way to the second.' It did so, after the 'March on Rome,' when the cabinet resigned, but the King declined to declare Italy in a state of siege, and Mussolini was invited to Rome to form a government. As Premier, or President of the Council, he took the oath to King and Constitution, amid universal enthusiasm, on Oct. 30, 1922.

On assuming many portfolios in the cabinet he formed, he became practically dictator. His swift bringing of order out of what threatened to be economic and political chaos aroused national pride. In 1929 he ended the long dispute between Church and State, establishing Vatican City. In 1933 he effected measures regulating private capitalism within the corporative state. He gradually replaced liberalism by discipline in politics and economics, through his system of training youths to practice his ideals; thus a generation acquainted with his aims grew up.

Mussolini brought about the successful Italian conquest of Abyssinia, 1935-6. In 1937 he accomplished an Italo-German entente. His armed forces seized Albania in 1939 and in 1940 he entered World War II on the side of Hitler. In 1940 his forces invaded Greece, but in 1941 they lost Ethiopia and in 1942-3 they lost Italy's entire African Empire and Sicily. July 25, 1943, Mussolini 'resigned' and, after a dramatic 'rescue,' joined Hitler in Germany. He assumed command of the Fascist forces in northern Italy. In April 1945 he, together with his mistress and some of his followers, was captured by patriots and murdered. Their bodies were buried in paupers' graves. The work he had done to better social conditions in Italy was vastly overshadowed by his criminal deeds.

**Mustang**, the wild horse of the North American prairies, descended from the horses imported by the Spaniards.

**Mustapha Kemal**. See **Kemal**.

**Mustard**, a genus of hardy, yellow-flowered annuals belonging to the natural order *Cruciferae*. The most common species are Black Mustard (*Brassica nigra*), which is found in the middle and south of Europe, and White Mustard (*B. alba*), also common in Europe. Black and white mustard are both cultivated for the preparation of table mustard.

**Mustard Gas**, dichloroethyl sulphide,  $(C_2H_4)_2Cl_2S$ , a poisonous gas discovered by Guthrie in 1861, and first used for military purposes during the Great War.

**Mustard Oil**, or **Allyl Isothiocyanate**,  $C_3H_5NCS$ , is present as a glucoside in the seeds of black mustard, from which it is obtained by boiling with water, or by the action of a ferment, myrosin, also present.

**Mustelidae**, a family in the bear section of carnivores, somewhat arbitrarily divided into otter-like (Lutrine), badger-like (Meline), and weasel-like (Musteline) sub-families.

**Mutation**, in biology, a sudden and spon-

taneous change, for reasons as yet unknown, creating a new form at a single leap. Those instances in which the change is not transmitted are called 'sports'; when the peculiarity descends to the offspring, the process is known as mutation.

**Mutiny, Indian**, a military revolt in India in 1857. The conduct of the government in Sindh and Burma had caused irritation; while the English military system was old-fashioned and stern. The adoption of greased cartridges, an outrage upon the religious sentiments of the Hindus, furnished an opportunity for the outbreak of the mutiny. The movement was mainly confined to Oudh and the Northwest Province. On March 29, 1857, the first outbreak occurred at Barrackpur, and the native mutineers then seized Delhi, setting up as their leader the old king of Delhi. Sir George Grey, the governor of the Cape, realized the gravity of the situation, and sent to India troops then on their way to China. At Cawnpur the English garrison, with many women and children, was massacred; but Lucknow was relieved by Havelock, in September 1857, and again in November by Colin Campbell. Delhi was captured in September, and the sons of the old king (who was spared) were shot by order of Hodson of Hodson's Horse. The result of the mutiny was the transference to the crown of the powers of the East India Company.

**Muttra**, or **Mathura**, town, capital of the Muttra district, in the United Provinces, India, on the right bank of the Jumna, 30 m. n.w. of Agra. It was once the center of the Buddhist faith.

**Myall Wood**, the hard wood of the Australian tree *Acacia pendula*. It has a pleasant fragrance, somewhat reminiscent of violets, and is much used for making tobacco pipes, though polishing destroys the natural scent.

**Mycenæ**, tn., Argolis, ancient Greece, at n. extremity of plain of Argos. It is said to have been founded by Perseus. It was the chief city of the Pelopid dynasty, and is especially famous in Homer as the city of Agamemnon. The excavations undertaken by Dr. Schliemann in 1876, and continued in 1877 by the Greek Archæological Society, fully justify Homer's epithet, 'Mycenæ, rich in gold.'

**Mycenæan Civilization** existed in Greece at some prehistoric period, and extended over the islands of the Ægean sea, the Troad in Asia Minor, Crete, and perhaps even parts of Sicily and Italy. The character of the finds in these widely separated sites is markedly uniform. The walls are of the kind called cyclo-

pean—composed of huge blocks of stone accurately fitted without the use of mortar. At Tiryns, Mycenæ, Troy, and Cnossus the remains of huge and imposing palaces, and at some places—above all at Mycenæ—great stores of golden ornaments have been found, together with implements, both weapons and domestic utensils, of bronze, and great quantities of pottery. At Tiryns, and at Cnossus more especially, remains have been found of wall-paintings, which illustrate the life, dress, and manners of the period to a remarkable degree. There are also some works in sculpture of great excellence. These remains indicate that the Mycenaean civilization was highly advanced. Among the archaeological treasures found at Mycenæ are pieces of porcelain inscribed with the name of Amenhotep III. of Egypt, and a scarab with his wife's name. The date of Amenhotep is about 1400 B.C.; from about 1500-1200 B.C., may be taken as the period at which this civilization was at its height. Homer and all Greek legend imply that the original rulers of Mycenæ had just been superseded by men of a newer race, called Achæans. The great palaces of Tiryns, Mycenæ, Amyclæ, and other places were destroyed by the succeeding Dorian invaders. As in many parts of Greece, notably Arcadia and Attica, the original inhabitants were never dispossessed, the Mycenaean race (the term may be used) was as truly Greek as the Arcadians and Athenians. Their civilization reached its height, not in Attica, but in Argolis, Crete, and the Troad. Hence it may be argued that the later civilization of Greece was only a development or a renaissance of the Mycenaean.

**Myelitis**, inflammation of the spinal cord. It may be acute or chronic, and its symptoms vary with the part of the spinal cord inflamed. Any marked loss of muscular power or of sensation may be caused by myelitis. One form is the cause of infantile paralysis.

**Mylodon**, a large extinct sloth, closely allied to those at present living in South America and to the Megatherium.

**Myna**, or **Mina** (*Eulabes religiosa*), an East Indian bird belonging to the starling family (Sturnidæ). It is black with purple and green iridescence, and bears a white patch on the wing-quills. It possesses considerable powers of imitation, and can be taught to speak.

**Myopia**, or **Short-sight**, a defect of vision due to structural abnormalities in the eye. Should the corneal surface of the eye and the crystalline lens be too convex, parallel rays are brought to a focus in front of the retina; and the same result ensues when the antero-

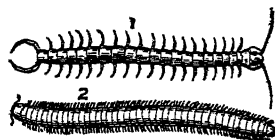
posterior axis of the eyeball is too long. In each case a blurred image is thrown upon the retina. But a concave lens of suitable strength placed before the myopic eye will focus the rays of light on the retina. The converse holds good in hypermetropia.

**Myosis**, a condition of the eye in which the pupil is unnaturally contracted, and slow to expand under ordinary conditions.

**Myosotis**. See **Forget-Me-Not**.

**Myrica**, a genus of shrub constituting the order Myricaceæ. *M. cerifera*, the common bay-berry, is a hardy shrub bearing waxy gray berries.

**Myriopoda**, a class of terrestrial arthropods which resemble insects in breathing by tracheal tubes, and in bearing one pair of antennæ on the head, but differ in possessing a wormlike body, with many legs. The two classes into which myriopods are divided are the centipedes, or Chilopoda, and the millipedes, or Chilognatha.



*Myriopods.*

1, Centipede; 2, millipede.

**Myrmidones**, an ancient Greek tribe who dwelt in Phthiotis in Thessaly. They were the soldiers whom Achilles led to the Trojan War. Their obedience to their leader has caused their name to be used as the designation of 'a devoted and unquestioning or unscrupulous follower' (myrmidon).

**Myrobalan Plum**, or **Bedda Nut**, names sometimes given to *Prunus cerasifera*, a hardy tree or shrub with unarmed branches. It bears solitary, or nearly solitary, white flowers in spring, and these are followed by red, globose, yellow-fleshed fruits. One species of Terminalia (*T. catappa*) is used as a shade tree in tropical countries, having an almond-flavored nut, and being called 'Mexican almond.'

**Myron**, Greek sculptor, was a native of Eleutheræ in Bœotia. He was born about 480 B.C., and was a younger contemporary of Phidias.

**Myrrhis**, a genus of hardy herbaceous plants belonging to the order Umbelliferae. The sweet cicely, or myrrh (*M. odorata*), is a European plant which bears compound umbels of white flowers, and has a distinct fragrance. It was formerly much grown as a pot herb.

**Myrtle**, or **Myrtus**, a genus of shrubs belonging to the order Myrtaceæ. In many cases the leaves and flowers are markedly fragrant.

**Mysia**, in ancient geography the n.w. corner of Asia Minor, between the Propontis (Sea of Marmora) on the n. and the Ægean Sea on the w. The Mysi were a Thracian people who migrated into Asia.

**Mysore**, or **Maisur**. Native state of Madras Presidency, India. It is intersected by spurs of the W. Ghats and by the Nilgiris; but the greater part of the country is undulating; p. 5,978,982. The principal rivers are the Kistna (Krishna) and the Cauvery. Gold is mined and iron smelted. The chief manufactures are jewelry, carpets, blankets, cotton and silk cloths. The state was under British administration from 1831 to 1881. Capital, Mysore; p. 83,951. Here is the Maharajah's palace and the residency.

**Mysticism**, in religion and philosophy, means the doctrine that God cannot be rightly apprehended by any ordinary process of knowledge, but only by an immediate intuition that transcends knowledge—an ecstatic vision or communion in which man becomes one with the Divine Being. As a religious phenomenon it is ethnic, appearing in all developed religions, and even in primitive religions, in embryonic form. India furnishes its most noteworthy manifestations; but prophetism in its various forms is essentially mystic. Mysticism in the West found its first noteworthy philosophical expression in the Neo-Platonic philosophy (see NEO-PLATONISM) of the 3d century A.D. Mysticism as a tendency, both philosophical and religious, was revived in the Middle Ages, when it operated as a complement to or counteractive of scholasticism. Among great mystics were Thomas à Kempis, and Bernard of Clairvaux. The close of the scholastic period, like its beginning, was signalized by the appearance of a mysticism of the more speculative type in the teaching of Eckhart, under whose influence there developed a German school of mysticism. Another name of considerable importance in the history of mysticism is that of Jacob Boehme. His doctrine was a mixture of the current half-magical, half-metaphysical conception of nature with the traditional Neo-Platonic mysticism. Of no great philosophical importance in itself, it nevertheless exercised some influence so late in the history of modern philosophy as the time of the post-Kantian German idealists. In modern philosophy proper the mystical tendency

has by no means been absent. In the modern Catholicism St. Theresa is especially famous.

**Mystic Shrine, Ancient Arabic Order, Nobles of The**. An order claiming an origin at Mecca in the 25th year of the Hegira. It made its appearance in New York in 1871. It is not a regular Masonic order, but is limited exclusively to Masons who have attained the 32d degree of the Ancient and Accepted Scottish Rite or who are Knights Templars.

**Mythology** is the scientific investigation of traditional beliefs; also the aggregation of such beliefs or myths. In this latter sense mythology embodies the historical elements of primitive religion as distinguished from its ethics. Further, it includes a mass of heterogeneous ideas that may be classified as hero-worship and distorted history, national and individual. Anthropomorphic instinct has produced many of the figures of mythology out of intangible natural forces. There is also the working of a converse tendency. There is reason, that is to say, for believing that many so-called supernatural beings have their originals in real people, whose actual characteristics, good or bad, have become much exaggerated in the course of a long stretch of time. The mythopœic tendency is a living and active process. The leading mythological systems may be summarized under Semitic, Indian, Egyptian, Græco-Roman, and Northern Mythologies. The 'one eternal God,' was known to the Semites as Ilu, from which comes Bab-Ilu, 'the Gate of Ilu,' otherwise Babylon. Beneath Ilu and his subordinate trinity were many deities, male and female. There was another triad, consisting of the Moon-god (Sin), the Sun-god (Shamash), and the God of the Atmosphere (Ramân). Moreover, as in Egypt, each town and district had its local god. The tutelary god of Babylon was Marduk. The Hindu theogony may be thus briefly outlined:—The supreme god was Varuna, and subsidiary to him was the Trinity, consisting of Surya (the sun), Agni (the god of fire), and Indra (the god of the atmosphere), who was also one with Vāyu (the god of the winds). Later the Hindu trinity, or Trimūrti, consisted of Brahma, Vishnu, and Siva. Brahmanism, in its purity stands midway between early Hindu mythology and the creed of the worshippers of Siva.

In Egypt the Eeternal became symbolized by the sun, afterwards personified as Osiris. From this anthropomorphic conception there resulted the idea of a female consort—Isis,

the symbol of æther; and from them proceeded Horus, or Orus, the third person of the trinity. The leading personages of the Græco-Roman pantheon such as Zeus or Jupiter, Venus or Aphrodite, Athena or Minerva, Artemis or Diana, personified both natural forces and human qualities—such as Virility, Beauty, Wisdom, Chastity; and much poetical imagination is shown in the allegories.

Norse mythology shows their interest in geography, war, and fierce battles with nature. It counts nine worlds. High above the mid-world is Asaheim, home of the Asas, or gods; downwards from the earth is Svartalfaheim (swart elf home); lower still, Helheim (abode of the dead). The Norse pantheon numbers twelve gods and twenty-six goddesses. The head god Odin, or Wodan (whence Wednesday), is the god of battle; Thor (whence Thursday), son of Odin is the Thunderer, wielding the hammer. The friend of man, Thor is incessantly harrying the intractable frost giants. The most beloved of all the gods is Balder, the beautiful, the sun-god. Prominent in Norse mythology are the Valkyrs, or choosers of the slain, who bear the

brave who have fallen in battle aloft to Odin's Valhalla.

**Mytilini.** (1) Or MITYLENE, also LESBOS, isl. of the Ægean Sea, belonging to Turkey in Asia. It is indented in the s. by two deep, landlocked harbors. In the interior it rises to 3,075 ft. The chief productions are olive oil, excellent wine, grapes, figs, and timber. Area, 675 sq. m.; p. (1896) 125,000. It was colonized by Æolian Greeks at an early date, and became the home of the Æolean school of lyric poetry. It was the birthplace of Sappho, Alcæus, Terpander, Arion, Pittacus, Hellanicus, Theophrastus, and Phamas. (2.) Or KASTRO, chief city in above isl., on e. coast.

**Myxœdema**, a disease in which a prominent symptom is the deposition of mucine subcutaneously. It is connected with atrophy or loss of function of the thyroid gland, and is a disease of the adult, the same condition of the thyroid in infants resulting in cretinism.

**Myxomycetes**, a division of the group of cryptogamic plants known as thallophytes. They represent the very lowest grades of vegetable life.



**N**, the fourteenth letter of the Roman alphabet. It is the point nasal; the mouth passage is closed by the point of the tongue, and the breath passes through the nostrils. It corresponds to the point stop *t*, and there are as many different *n*'s as there are *t*'s. (See *T*.) Before *b* and even *f*, *n* naturally changes into *m*, and words spelled with *n* in this position are often pronounced with *m* (in Arabic or Welsh); so in 'Banff' and in the local pronunciations of 'Denbigh' and 'Dunbar' (cf. 'Dunbarton'). A common phonetic change of *n* is into *ng*, the back nasal. The early Semitic form of *N* was the present form inverted and having a long right hand stroke.

**Nabob**, or **Nawaub**, a title applied to the administrator of a province under the Mogul empire in India. After the fall of that empire it was applied to natives of wealth.

**Nadir**, the point of the sky opposite to the zenith and vertically beneath the spectator. It is determined as a zero point for measuring declinations, by directing a telescope straight down towards a basin of mercury, and observing the coincidence of the reticle at the focus with its reflected image.

**Naeglele, Charles Frederick** (1857-1944), American portrait and figure painter, studied art in New York City, and received prizes for the George Inness diploma, the Proctor diploma, and the seal of the Salmagundi Club of New York. Among his noted portraits are those of Charles L. Tiffany.

**Nægelia**, a genus of tropical American herbaceous plants belonging to the order Gesneraceæ. As their heart-shaped leaves are often beautifully shaded, and their racemes of flowers usually brilliantly colored, they are often cultivated as hothouse plants.

**Nagasaki**, town and important seaport, of Kiushiu, Japan. It owes its importance as a coaling station to its proximity to the rich coal mines of Takashima, 7 m. s.e. Its foreign commerce is extensive. There are engine works and shipyards. Nagasaki is noted for its temples. In 1945 it was heavily damaged by atomic bomb; p. 210,700.

**Nägeli, Karl Wilhelm** (1817-91), Swiss botanist, was born near Zürich. He gave the first account of growth by means of a single apical cell, and is one of the greatest figures in the history of botany. His chief work is *Beiträge zur Botanik*.

**Nahuatlán**, a family in Mexico comprising seven tribes, the chief of which at the time of the discovery was the Aztec.

**Nahum**, the seventh among the minor prophets of Israel.

**Nails**, thin pieces of metal with one pointed end, used for many purposes but chiefly in carpentry and woodwork. Treenails are hard wooden pins employed where metal would be likely to rust. Nail making was an early household industry in New England. They were forged on an anvil from nail rods prepared by rolling malleable iron into small bars or by cutting plate iron into strips by means of shears. But by the close of the 18th century many machines for making nails had been patented and were in use. Wire nails were first made on a large scale in the United States about 1876, and since that time the industry has developed rapidly.

**Nails**, in biology, are structurally modifications of the skin, occurring in man and other mammals, at the ends of the fingers and toes. Ingrowing toe nail is the common nail trouble. The irritation of the flesh by pressure on the sharp lateral edges of the nail sets up inflammation. Treatment is to relieve pressure by paring the nail, to avoid tight or pointed shoes, and to pack cotton between the nails and the flesh.

**Nairnshire**, maritime county, Scotland, bounded on the n. by Moray Firth, on the s. and the w. by Inverness-shire; area 162 sq. m.

**Nairobi, British East Africa**, capital of Ukamka province, 330 m. n.w. of Mombasa. It is an important trade center and is a flourishing well built town with many handsome buildings. It is a center for big-game sportsmen; p. 51,599.

**Namaycush**, (*Christivomer namaycush*), a large fish of the salmon family; common

in the Great Lakes and in the lakes of New York State, as well as in the rivers of British Columbia. It usually weighs about 20 pounds and is trout-like in form and character.

**Namaqualand**, region of the former German South West Africa, stretching n. from the Orange River. Mostly a desert, its scant drainage is gathered by the Great Fish River. Since the Great War it has been administered under a mandate of the Union of South Africa.

**Names.** Every object has a class name which it shares with all the members of the class to which it belongs (elm, desk, road). Many objects and practically all persons also have individual names, which have to be learned in each case separately. These are called 'proper names.' Among the Romans three and even four names were employed—*prænomen*, *nomen*, *cognomen*, and *agnomen*, and stood in that order. The Arabic system is even more complex. In modern civilized countries there are two elements in every name—the primary name or names, known as the baptismal or Christian name, and the family name or surname. Following the Reformation Scripture names became common. Puritanism encouraged this tendency, and added names of its own, such as Faith, Hope, Charity, Prudence, Mercy. The most popular names are those which have been made famous by some great king or national hero. The use of surnames as primary names has become increasingly common in the United States since the middle of the last century. Surnames at first were personal epithets which identified a man by reference to his home, his father's name, his occupation, or some peculiarity in his appearance or character. In England they began to be hereditary in the 11th century, but even yet there are districts where the transmission of the surname is not universal. The law generally protects persons and corporations in the use of trade names which have become generally known by usage as against persons who may fraudulently assume them for the purpose of benefitting by the business reputation, and good faith, which trade names may carry with them; but a person of the same name as an established business name may use his own name in his business if he does not abbreviate it, or otherwise change it to conform to the established name. In place names, descriptive phrases are commonly used or they are named for the founder of the town or renamed for a conqueror or sovereign. The

name is often a corruption of the early native terms describing a place. In colonized countries (as America) the colonists adopt names of the mother countries, and local influences have not played so important a part.

**Namur**, Belgian province on the French frontier. Fertile and rich in minerals, iron, coal, copper, lead, marble, slate, and building stone. The province was overrun by the Germans in World War I and seized by them in World War II; p. 353, 451.

**Namur**, city, Belgium, capital of the province of Namur, is situated at the confluence of the Sambre and the Meuse. The citadel occupies a scarped height in the angle of the rivers. Cutlery is manufactured; there are pottery, porcelain, and glass works, and coal, iron, and limestone are worked. The advancing Germans brought their guns to bear upon the supposedly impregnable fortifications on Aug. 20, 1914; and by the 25th the last forts had given in; p. 31, 164.

**Nan-chang-fu**, capital of the province of Kiang-si, China, on the right bank of Kan River. It is a center of the porcelain trade; p. (estimated) 150,000.

**Nancy**, chief town and capital of the department of Meurthe-et-Moselle, France, lies near the left bank of the river Meurthe. Interesting features are the Franciscan church (1477), where several of the dukes of Lorraine lie buried; the Cathedral of Notre Dame (1703-42); the Hotel de Ville with paintings by Rubens and Van Ruysdael; the episcopal palace; the museum of Lorraine, with interesting archaeological specimens; and the University, which dates from 1572. Fierce battles for possession of the town have taken place. In 1477 Charles The Bold was killed near here fighting the Swiss. In the Great War, 1914, after a month's fighting the Germans were repulsed. The principal manufactured products are embroidery, textiles, pottery, hardware, gloves; p. 114, 491.

**Nanking**, or **Chiang-ning-fu**, capital since 1928 of the Republic of China. At different times between 222 and 501 A.D. Nanking was the capital of China, and again in 1368-1403. Taken by the Taipings in 1853, its 'porcelain tower' was destroyed by them and little was left standing. It has since, however, rapidly recovered. Its silks and satins are famous in China, its nankeens in Europe. It makes war materials. The tomb of the first Ming emperor (Hung Wu) is near the city. Nanking was occupied by Japs, 1937, and the capital removed to Chungking. p. 522, 696.

**Nansen**, **Fridtjof** (1861-1930), Norwegian

explorer and naturalist, was born near Christiania. In 1893 he sailed on the *Fram* to the New Siberia Islands, and drifted northwards for two winters, after which he left the ship, accompanied by Johansen, and advanced as far north as  $86^{\circ} 13.6'$ , 184 miles nearer to the North Pole than any one had yet reached. The narrative of the expedition appeared as *Farthest North* (1897). Nansen took a prominent part in the movement for the separation of Norway from Sweden. In 1918 Nansen was made chairman of the Norwegian Association for the League of Nations. He carried on the great work of relieving the starving populations of Russia and Asia Minor. For this great endeavor he was awarded the Nobel Peace Prize, in December 1922.

**Nantes**, town, France, capital of the department of the Loire-Inférieure, is situated on the right bank of the Loire. The ducal castle, founded in 938, and rebuilt in 1466, was the occasional residence of Charles VIII. and the place where on April 15, 1598, Henry IV. signed the famous Edict of Nantes. In 1914 the harbor was improved. Sugar manufacture is important; p. 184,509.

**Nanticoke**, borough, Pennsylvania, Luzerne co. It is an important coal-mining center; p. 24,387.

**Nantucket**, town, Massachusetts, county seat of Nantucket co., is situated on the north shore of Nantucket Island. It is a quaint summer resort. Whaling was formerly important. Dairying and fisheries are the chief occupations; p. 3,401.

**Nantucket**, the largest of the islands which together compose Nantucket co. It is about 15 m. long, and its surface is sandy, rolling, and treeless. At its eastern end are wireless and light-stations.

**Naoroji, Dadabhai** (1825-1917), known as the 'Grand Old Man of India,' was the first Parsee to sit in the British House of Commons. He lived chiefly in England from 1855 to 1907 and in 1867 he helped to establish the East India Association.

**Naphtha**, a term applied to the mixture of low-boiling hydro-carbons obtained in the distillation of petroleum, coal tar, and shale oil. Petroleum naphtha consists chiefly of paraffines and naphthenes; coal-tar naphtha, obtained by washing coal gas with heavy oil, is mainly benzene ( $C_6H_6$ ) toluene ( $C_6H_5CH_3$ ), and higher homologues; while the naphtha of shale oil contains olefines as well as paraffines. All these naphthas are volatile, very inflammable liquids with a benzene-like odor, and

are valuable as solvents for fats, resins, and gums, and as fuel in vapor lamps and motors.

**Naphthalene**,  $C_{10}H_8$ , an aromatic hydrocarbon, constituted by the apparent junction of two benzene rings, is obtained from the heavy oil fractions distilled from coal tar.

**Naphthol**,  $C_{10}H_7OH$ , exists in two varieties, which are the mono-hydroxy derivatives of naphthalene.

**Naphthylamine**, or **Amido-Naphthalene**,  $C_{10}H_7NH_2$ , is known in both the isomers. They are crystalline solids slightly soluble in water. Both naphthylamines are easily soluble in the ordinary organic solvents and are used as intermediates in the manufacture of dyestuffs.

**Napier, Sir Charles** (1786-1860), British admiral, was born in Stirlingshire, Scotland. He entered the navy in 1799 and after serving in the Channel and the Mediterranean, became the hero of several daring exploits in the Mediterranean, notably the capture of Ponza. Having been sent to the United States (1814), he took part in the British naval operations in the Potomac and against Baltimore. He commanded the frigate *Galatea* in 1829-32 and in 1833 entered the service of Dom Pedro of Portugal.



*Naples.*

Panorama of the city as viewed from the Villa Patrizi.

**Napier, Sir Charles James** (1782-1853), British general, was born in London. In 1813 he took command of a brigade in an expedition against the United States, serving on the Virginia and Carolina coasts. He was governor of Cephalonia, one of the Grecian Islands, from 1822 to 1830, and in 1841 was sent to India to command the army in Bombay.

**Napier, Sir Francis, Ninth Baron Napier, and First Baron Ettrick of Ettrick** (1819-98), British diplomat, was appointed Envoy-Extraordinary to the United States (1857). He was subsequently governor of Madras (1866-72) and administered that office with great ability and tact. Upon the assassination of the Earl of Mayo, he acted as Viceroy of India, from February to May 1872, when he retired to England.

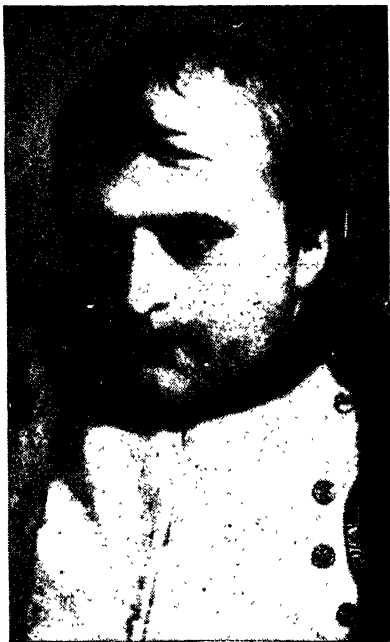
**Napier, John** (1550-1617), Scottish mathematician. His chief claim to fame rests on his discovery, after long study, of the use of logarithms, involving the use of 'Napier's rods' or 'bones,' one of the earliest mechanical calculating devices.

**Napier, Robert Cornelis, Lord Napier of Magdala** (1810-90), British field-marshal. He distinguished himself during the Indian Mutiny, particularly by his work in the relief of Lucknow. He headed a successful expedition to Abyssinia in 1868, where his storming of Magdala won for him a peerage. From 1870 to 1876 he was commander-in-chief in India, and from 1876 to 1883 was governor of Gibraltar.

**Naples**, seaport and largest city of Italy, capital of the province of Naples, is beautifully situated at the foot of a circle of hills on the north side of the Bay of Naples; p. 925,000. Across the bay to the s. is the island of Capri, while to the w. are the ruins of Cumæ, the oldest Greek colony in Italy. To the s.e. are the remains of Pompeii, while towering over the whole is Mount Vesuvius, the pride and terror of the city. Other nearby places of interest are Sorrento, Amalfi, Salerno, Ischia, and Paestum. The famous Aquarium is one of the finest establishments in the world for the study of aquatic flora and fauna, and the national museum, one of the largest and finest museums of antiquities in the world. Here are many objects from Herculaneum and Pompeii, and a choice collection of mosaics and paintings. The whole region is still rich in archaeological remains, most of which become the property of the museum. In the city are many impressive churches and old buildings. Nearby to the s.w., is the University. Naples is an important manufacturing and commercial center, and the chief port of embarkation for emigrants. Its harbor is modern and spacious, and it has direct communication with all parts of the world. Founded very early by Rhodian navigators under the name of Parthenope, it was seized by the Romans in 326 B.C., and early became a cen-

ter of learning as well as a favorite summer resort. After having been incorporated with the eastern Empire, it became a duchy in 572. In 1139 it was made the capital of the Kingdom of Naples. The French took it in 1501, and the Spaniards two years later. It was captured by the Austrians in 1707, submitted to Don Carlos in 1734, and became the capital of the French Parthenopean Republic in 1799. Joseph Bonaparte resided here as king from 1806 to 1808, when he was succeeded by Joachim Murat, and Ferdinand IV. The rule of the Bourbons ended with the entrance of Garibaldi, in 1860.

**Napoleon I.** (1769-1821), emperor of the French, was born in Ajaccio, Corsica, Aug. 15, 1769, son of Carlo Maria de Buonaparte (Bonaparte), whose ancestors had migrated from Italy two centuries earlier. He was sta-



*Napoleon Bonaparte.*

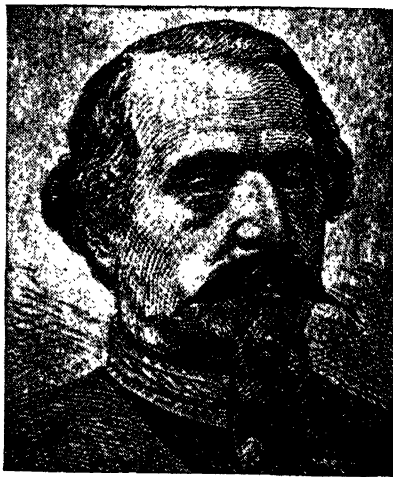
tioned in Valence until 1791; was in Paris during the insurrection of June 20, 1792, and witnessed the overthrow of the monarchy on August 10. He was entrusted by Barras with the task of suppressing the rising of Paris. He met Josephine Beauharnais, to whom he was married March 9, 1796. On March 11, 1796 Napoleon started on his Italian campaign which ended in the peace of Campo Formio (Oct. 17, 1797), inaugurating the policy of

territorial redistribution which was a leading characteristic of the Napoleonic period. On his return to Paris, Bonaparte obtained permission of the Directory to attempt the conquest of Egypt, as a prelude to the restoration of French supremacy in India. On July 21 he won the Battle of the Pyramids, but on Aug. 1 was defeated by Nelson in the Battle of the Nile (Aboukir). Hearing of the success of the second coalition in Europe, of the French loss of Italy, and of the unsettled condition of France, he left Kléber in command in Egypt, and returned to France (Oct. 9, 1799). The revolution of Brumaire followed, and the Consulate was established, with Bonaparte as First Consul at the head of the government. On March 27, 1802, the peace of Amiens was signed with Great Britain; on Aug. 1 Bonaparte was proclaimed Consul for life. The concordat with the Pope had already (1801) been signed, and Napoleon gave to the nation the Bank of France, and the Code Napoléon. During the years 1802 and 1803, however, Napoleon made preparations for a fresh development in foreign policy. He proposed to found one colonial empire in the New World and another in India. He determined to rearrange the map of Germany and to destroy Britain's commerce. On May 18, 1804, he became Emperor of the French. The fall of Ulm (October 20, 1805) opened the way to Vienna; and though Nelson's victory at Trafalgar, on October 21, destroyed the Spanish and French fleets, Napoleon defeated the Austrians and Russians on December 2 at Austerlitz, and on December 26 forced the Emperor Francis II. to make the treaty of Pressburg. In July, 1806, Napoleon formed the Confederation of the Rhine. The Holy Roman Empire ceased to exist, and on Aug. 6, 1806, the Emperor Francis II. formally renounced his title of German Emperor. No sooner had Napoleon made Joseph Bonaparte King of Spain (June, 1808) than the Spanish people rose, and an English expedition landed in Portugal (August), and Wellington won the battle of Vimiero. The Peninsular War proved one of the principal causes of the fall of Napoleon. In seeking to strengthen his position, Napoleon was led to divorce Joséphine, and in 1810 to marry Marie Louise of Austria. At the same time he made almost superhuman efforts to ruin England by means of his Continental System. His disastrous campaign to Moscow in 1812, undertaken while he had the Spanish War on his hands, encouraged Europe to rise, and in 1813 the war of liberation began. The

adhesion of Austria to the ranks of his enemies was followed by the total defeat of the French at Leipzig (Oct. 16-19, 1813). After showing consummate but unavailing skill in the campaign in France during the spring of 1814, Napoleon was forced to abdicate April 11, and Louis XVIII. entered Paris. After a short sojourn in Elba, Napoleon escaped and landed in France on March 2, 1815, and his reign of a hundred days began. The battle of Waterloo (June 18) completed the downfall of his hopes, and he ended his days on the Island of St. Helena. See *Correspondance de Napoléon I.* (32 vols., 1858-70), Rose's *Life of Napoleon I.* (1902); Watson, *Napoleon* (1926).

**Napoleon II.** (1811-32), the son of Napoleon I. and Marie Louise, sometimes known as the Duke of Reichstadt. He is the hero of E. Rostand's play, *L'Aiglon* (1899).

**Napoleon III.** (1808-73), Emperor of the French, was the son of Louis Bonaparte, brother of Napoleon I., and of Hortense Beauharnais, daughter of Joséphine. He was born in Paris. On the death, in 1832, of the Duke of Reichstadt, son of Napoleon I., he became the head and hope of the Napoleonic party. On Dec. 2, 1852, the Empire was proclaimed, with Napoleon III. as Emperor.



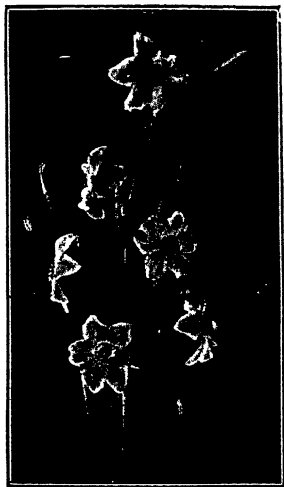
*Napoleon III.*

Napoleon supported England and Turkey in the Crimean War. From 1860 to 1870 Napoleon steadily lost ground. Instead of developing a constitutional monarchy, he continued his despotic régime. He adopted a menacing attitude towards Prussia when news came that a Hohenzollern prince had

been selected as the future King of Spain. Owing partly to Bismarck's determination, war broke out in August, 1870. The French were defeated at all points, and after the battle of Sedan, on September 1, Napoleon surrendered himself to the Prussians. A republic was declared in Paris, and the Empress Eugénie, whom he had married in 1853 and his son fled to England, where they were joined by the Emperor in 1871.

**Napoleon, Eugène Louis Jean Joseph** (1856-79), better known as the Prince Imperial, the only son of Napoleon III. and the Empress Eugénie, was born at Paris. On the outbreak of the Zulu War he volunteered his services, and on June 1, 1879, was killed by a party of Zulus.

**Narbonne**, tn., France, dep. Aude, 8 m. from Mediterranean and 94 m. by rail e.s.e. of Toulouse. It commands the only easily accessible entrance from s.w. France into Spain. Its heather-honey is famous; the town also makes brandy and prepares wine. The 13th-century cathedral and town-house (now a museum) are the principal buildings.



*Narcissus Poeticus.*

**Narcissus**, a genus of hardy bulbous plants belonging to the order Amaryllidaceæ. They have linear or strap-shaped leaves and usually beautiful flowers, either white or yellow. The genus has been divided into three large groups: (1.) The Magni-Coronati group, made up of the smaller groups which have long crowns or trumpets. These are the true daffodils. (2.) The Medio-Coronati group, made up of those which have crowns or cups

of medium size. (3.) The Parvi-Coronati group, composed of those which have short crowns of a flat, saucer-like shape.

**Narcissus**, in ancient Greek Mythology, a beautiful youth who, however, was insensible to the passion of love. To punish him for his lack of feeling, he was made to fall in love with his own likeness, and gradually wasted away until he was metamorphosed into the flower called by his name.

**Narcotics**, in medicine, the drugs which induce a deep sleep, practically stupefaction, ending in death if the dose be extreme. Opium and its alkaloids, alcohol, chloral, belladonna, and Indian hemp are examples.

**Narcotine**,  $C_{20}H_{27}NO_7$ , an alkaloid occurring in opium. It has no narcotic-properties, but has been usefully employed in the treatment of ague.

**Nares, Sir George Strong** (1831-1915), British Arctic explorer and vice admiral, born in Monmouthshire, took part in the Franklin search expedition of 1852-4. In 1875-6 he led a famous polar expedition, proceeding by way of Smith Sound. A sledging party reached lat.  $83^{\circ} 20'$ , the nearest point to the pole attained up to that time.

**Narragansett Bay**, an inlet of the Atlantic Ocean extending into Rhode Island as far as the city of Providence. It is about 30 m. long by from 3 to 12 m. wide. It contains several islands, including Rhode I. and Conanicut, Prudence, and Hope Isls. Newport is situated at its entrance.

**Narragansett Indians**, an Algonquin tribe of Rhode Island Indians, who dwelt along the western shore of Narragansett Bay. They were especially friendly to Roger Williams in 1636. In 1645, however, there was trouble, but of short duration, and later, under Canonius, the Narragansetts participated in King Philip's War, and in the Great Swamp Fight, Dec. 19, 1675, they were practically all destroyed.

**Narrows, The**. A strait about  $3\frac{1}{2}$  m. long and from  $1\frac{1}{4}$  m. to  $2\frac{1}{2}$  m. wide, connecting Upper and Lower New York bays and separating Long I. from Staten I. (Bor. of Richmond).

**Narwhal** (*Monodon monoceros*), one of the toothed dolphins peculiar to the Arctic region. They occur in small schools and feed on cuttles, small crustaceans, and fish. The head is blunt and rounded, the back fin absent, the flippers short and wide. Narwhals are hunted both for the sake of their ivory and for the oil.

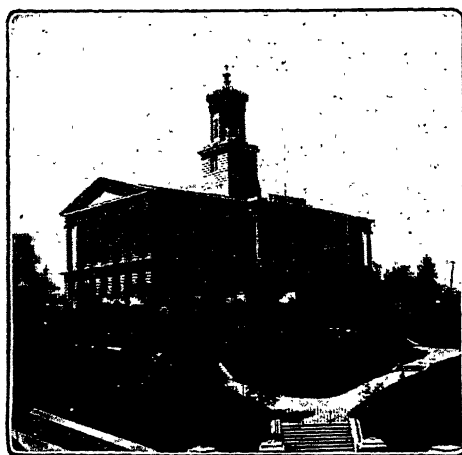
**Nascent State**. Elements exhibit greater

chemical activity at the moment of their liberation from compounds than at other times.

**Naseby**, par., Northamptonshire, England, 12 m. n.e. of Rugby. Here, on June 14, 1645, the Royalists were defeated by the Parliamentarians under Fairfax and Cromwell.

**Nash, Thomas** (1567-1601), English poet and pamphleteer, was the son of a Lowestoft minister. He wrote against the Puritans in the Mar-Prelate controversy, and waged a private feud with Gabriel Harvey, the personification of Cambridge pedantry. Chief works: *The Unfortunate Traveller, or the Life of Jack Wilton* (1594; ed. E. Gosse,

more than \$16,000,000 in institutions of higher learning. It has Vanderbilt University, George Peabody College for Teachers, Fisk University, and Roger Williams University. The chief industries are the manufacture of self-raising flour, hardwood and its products, hosiery, overalls and work shirts, stoves and hollow-ware, cotton bags, and snuff. Publishing and printing are also of importance. The first settlement, Nashborough, was made in 1780 by people from North Carolina, and in 1784 the place was incorporated as Nashville, though it was not chartered as a city until 1806. Nine sq. m. of territory were added to the city limits in 1906; p. 167,402.



Nashville, Tennessee: Left, State Capitol; Right, Post-office and Federal Building.

1892); *Have with you to Saffron Walden* (1596); *Summer's Last Will and Testament* (acted 1592, printed 1600), *Collected Works*, ed. A. B. Grosart (1883-5).

**Nashua**, city, N. H., one of the county seats of Hillsboro co., 31 m. s. by e. of Concord, situated at the junction of the Merrimac and Nashua rivers. Good water power is obtained from the Nashua River, and manufacturing is the chief industry. Among the chief products are foundry and machine-shop products, boxes, cotton goods, furniture; p. 32,927.

**Nashville**, capital of Tennessee, second largest city of the State, and county seat of Davidson co., is situated on the Cumberland River, 186 m. s.w. of Louisville, Kentucky. The city has an area of about 18 sq. m. Ten m. e. of Nashville is The Hermitage, Andrew Jackson's home. Nashville is an important educational center, having invested

**Nashville, Battle of**, a battle of the Civil War, fought Dec. 15-16, 1864, near Nashville, Tenn., between about 48,000 Federals under General Thomas and about 26,000 Confederates under General Hood. Thomas, in spite of the impatience of his superiors, delayed his attack until he could complete his preparations, and in the two days' battle completely defeated the Confederate army.

**Nasik**, capital of Nasik district, Bombay, India, on the Godavari River, 89 m. n.w. of Ahmadnagar. The town is one of the most holy places of the Hindus owing to its location on the sacred river and is the scene of many pilgrimages. Wheat, millet, pulse, rice, oil seeds, and cotton are produced.

**Nassau**, former German territory and duchy, now forming part of the province of Hesse-Nassau, Prussia. On the extinction of the male line of the Orange branch by the death of William III. of Holland in 1890, the

duke of Nassau became grand duke of Luxembourg.

**Nassau**, capital of the Bahama Islands, British West Indies, on the northern coast of the Island of New Providence. The town is a popular winter resort, and the chief port of the Bahamas. Nassau was founded by the English in the seventeenth century; p. c. 9,000.

**Nast, Thomas** (1840-1902), American illustrator and caricaturist, was born in Landau, Bavaria. His mother came to America when he was six years old. His caricatures powerfully influenced public opinion in the North in favor of the war, and Lincoln styled him 'our best recruiting sergeant.' After the war Nast took up political cartoon work, especially in connection with the campaign against the powerful Tweed Ring in New York City. He created the tiger as the symbol of Tammany, the elephant to represent the Republican Party, and the donkey to represent the Democratic Party. Besides his periodical work, Nast illustrated a number of books.

**Natal**, province of the Union of South Africa, bounded on the north by the Transvaal and Portuguese East Africa, on the east by the Indian Ocean, and on the south and west by the Cape of Good Hope, Basutoland, and Orange Free State. Area, 35,290 sq. m., including Zululand. The province occupies the seaward slope of the South African Plateau. The climate varies from subtropical along the coast to bracing cold in the highlands. Natal is rich in mineral resources, which remain comparatively undeveloped, however. Coal, gold, copper, tin, asbestos, iron, lead, fire clay, marble, molybdenum, silver, and gypsum are found. In the coastal region, sugar cane, sweet potatoes, coffee, cotton, indigo, tea, and a wide variety of tropical and semi-tropical fruits are raised. The pastures of the highlands afford excellent grazing land, and sheep and goat raising is a leading industry. Natal was discovered by Vasco da Gama on Christmas Day, 1497 (hence its name). During the 18th century the Dutch attempted unsuccessfully to colonize the country. They were followed in 1823 by the British, who were driven out in 1828 by Dingaan, king of the Zulus.

Natal was made an independent colony in 1856. On May 31, 1910, the colony became an original province of the Union of South Africa; p. 1,429,398.

**Natal**, capital of the state of Rio Grande do Norte, Brazil, near the mouth of the Rio

Grande and the Atlantic Coast. It is the chief port of the state; p. c. 30,700.

**Natal Grass**, a native grass of South Africa, now grown in many other warm countries. It is a perennial, attains a height of 3 ft. under favorable conditions, and is valuable for pasture and hay. It has been introduced into the Southern United States.

**Natchez**, The French, on settling in the lower Mississippi valley, found a tribe of Indians occupying the districts which lie round the modern city of Natchez, along St. Catherine Creek. They were the Natchez, who were related to other tribes which dwelt between the Mobile and the Mississippi, and who have had woven around them a halo of romance through the writings of Chateaubriand and others. They seem to have practised agriculture, the textile and ceramic arts, and basketry.

**Natchez**, city, Mississippi, county seat of Adams co., on the Mississippi River, 214 m. by rail and 280 m. by water n.w. of New Orleans. The city is connected by packet lines with other places on the Mississippi, and is the seat of an active trade in cotton and cotton products and cattle. Industries include cotton and cottonseed-oil mills, saw and planing mills, and an artificial ice plant. Fort Rosalie was built by the French in 1716 on the present site of the city. By the Treaty of Paris (1763) the territory passed into the hands of the English, who soon erected a prosperous village here. In 1779 a Spanish force took possession, who were in turn dispossessed by American settlers in 1798; and it was the capital of Mississippi from 1798 to 1820; p. 15,296.

**Nathan, George Jean** (1882- ), Am. dramatic critic, born Fort Wayne, Ind.; ed. Cornell. With H. L. Mencken founded the *American Mercury*; wrote *The Popular Theatre*; *The Art of the Night*; *Comedians All*; *The American Credo*.

**Nathanael**, a disciple of Jesus, whose name occurs only in the Gospel of St. John. Little is known of him except that he was born at Cana in Galilee and was brought to Jesus by Philip.

**Nation, Carrie (Moore)** (c. 1840-1911), American anti-saloon agitator, was born in Woodford co., Ky. She first came into prominence in 1900 at Kiowa, Kans., where she demolished the windows of three saloons. From that day she travelled over the country, smashing saloon appurtenances in many cities, a hatchet being her favorite weapon.

**National Academy of Design**, an Ameri-



can society of painters and sculptors, incorporated under its present title in 1828. It was the direct outgrowth of the New York Sketch Club, organized by a number of young artists in 1825. The Academy has been characterized, in general, by marked conservatism, and has stood for the traditional as opposed to the modern tendencies in art. Since its union with the Society of American Artists, 1906, however, it has adopted a more liberal policy, excluding only the most radical work. Its membership includes 158 associate members, and 145 academicians.

**National Academy of Sciences, The**, an organization incorporated by Act of Congress in 1863 to investigate and report upon any subject of science or art, whenever called upon to do so by any department of the U. S. Government, the expenses of such investigation to be paid by legislative appropriation. The Academy has conducted many important investigations for the Government, particularly before the establishment of the numerous scientific and technical divisions of the executive departments. Membership is limited to 300 active members and 50 foreign associates.

**National Anthems, or National Hymns.** The national anthem of the United States, prescribed for ceremonial occasions by Army and Navy regulations, is the *Star Spangled Banner*, written by Francis Scott Key in 1814. The origin of the British national anthem, *God Save the King*, is involved in obscurity. The words were probably derived from an old folk song, and the air is generally credited to John Bull, who lived between 1560 and 1628. The stirring *Marseillaise* of the French was written and composed in 1792 by Rouget de Lisle, and has played an important part in French history. The Canadian national anthem is *The Maple Leaf Forever*, by Muir (1871).

**National Civic Federation**, an organization of prominent men and women in the United States, representing labor, capital, and the general public, and having for its purpose the solution of problems attendant on industrial and social progress; the provision for the study and discussion of questions of national import; the formation of enlightened public opinion, and the promotion of legislation in accordance therewith. The work of the Federation is carried on through nine departments. The *Industrial Conciliation Department*, the *Industrial Economics Department*, the *Welfare Department*, the *Woman's Department*, the *Department on Industrial*

*Accidents Compensation and Prevention*, the *Social Insurance Department*, the *Department on the Regulation of Trusts* and the *Department of Interstate and Municipal Utilities*. Consult *National Civic Federation Review*.

**National Education Association of the U. S.**, an association of American educators, educational institutions, and others actively engaged in educational work, having for its object the elevation of the character and advancement of the interests of the profession of teaching, and the promotion of the cause of education in the United States. It was founded in 1857 as the National Teachers' Association; in 1870 the name was changed to National Educational Association; and in 1906 to National Education Association of the United States, under which title it was granted a national charter.

The association consists of 23 departments which take up special problems of method, organization, and course of study in nearly every type of educational work. There are also more than 15 standing committees actively at work on professional problems. The National Education Association has been one of the leading educational factors in the United States. It has profoundly modified the curriculum of the secondary and the elementary schools by means of the reports of the Committee of Ten and the Committee of Fifteen, appointed in 1892 and 1893 respectively; and it has exercised a widespread influence through its reports on rural schools, public and school libraries, industrial education, college entrance requirements, normal schools, and teachers' salaries and pensions.

**National Gallery**, in London, the principal depository of the pictures belonging to the British nation. The present building stands in Trafalgar Square; it was finished in 1838 at a cost of \$500,000, and was enlarged in 1861, 1869, 1876, and 1887. Among its most valuable possessions are Raphael's *Madonna degli Ansdei* purchased, 1884 for \$350,000; the Velasquez *Venus* for which \$225,000 was paid in 1906, and Holbein's *Duchess*, purchased, 1909, for \$250,000, by an anonymous donor.

The Gallery contains more than 1,650 pictures, of which about 1,100 are in Trafalgar Square, the rest at the Tate Gallery and elsewhere. The National Portrait Gallery, founded in 1856, occupies a handsome suite of buildings at the rear of the National Gallery.

**National Guard.** See *Militia*.

**National Industrial Recovery Act.** See **United States, History, New Deal.**

**National Insurance.** Various forms of social insurance provided by the state are embraced under this title, of which the oldest and more important are sickness, accident, old age, and invalidity insurance. Unemployment and maternity insurance are of more recent institution, as are also pensions for widows and orphans, and mothers' pensions, so-called, which in several countries partake of the nature of insurance. National insurance was first put into law in Germany in 1883; and since that time its scope has been greatly widened. England's first insurance law in 1911 provided for a compulsory and contributory system in which the finance is shared by the employers, employees, and the state. Some type of national insurance is in force in Belgium, France, Denmark, Austria, Switzerland, Italy, Russia, Norway and Sweden. See **OLD AGE PENSIONS.**

**Nationality,** in international law, the status of a person as a citizen, subject, or member of the sovereign state to which he owes allegiance and from which he is entitled to receive protection. As applied to persons, it is nearly synonymous with citizenship, using the latter term in its broad sense.

**National Law.** See **International Law.**

**National Library, U. S.** See **Library of Congress.**

**National Monuments.** See **National Parks.**

**National Museum, U. S.** See **Smithsonian Institution.**

**National Parks,** in the United States, are more or less extensive tracts of public land reserved by special act of Congress from sale or other disposition, and set apart for the recreation and instruction of the people. The usual motive for such reservation has been to preserve in their natural condition scenic wonders and large areas of primitive wilderness. In some cases, the preservation of archaeological ruins or of natural resources or mineral waters has also been sought. At present there are nineteen national parks, covering a total area of 11,804 sq. m., of which thirteen are of notable size and scenic magnificence. The thirteen great national parks, in order of size, are as follows: (1) Yellowstone National Park (created 1872), located in northwestern Wyoming, comprises 3,348 sq. m., and is famous for its geysers, boiling springs, mud volcanoes, canyons, lakes, and waterfalls. (2) Mount McKinley

National Park (created 1917), located in south central Alaska, contains 2,645 sq. m. and has the highest mountain in North America (20,300 ft.). (3) Glacier National Park (created 1910), located in northwestern Montana, contains 1,534 sq. m. (4) Yosemite National Park (created 1890), situated in central California, includes 1,125 sq. m. (5) Grand Canyon National Park (created 1919), contains 996 sq. m., and is said to be one of the most sublime spectacles in the world. (6) Sequoia Park (created 1890), in central California, covers 604 sq. m., and includes mountains and precipices, groves of the famous Big Trees, with thousands of trees exceeding 10 ft. in diameter. (7) Rocky Mountain National Park (created 1915), located in northern Colorado, comprises 378 sq. m. (8) Mount Rainier National Park (created 1899), in western Washington, contains 325 sq. m. (9) Crater Lake Park (created 1902), in southwestern Oregon, covers 249 sq. m. (10) Hawaii National Park (created 1916), 242 sq. m. in area, in the Hawaiian Islands, contains the volcano of Mauna Loa, the largest active volcano in the world. (11) Lassen Volcanic National Park (created 1916), in northern California, contains the only active volcano in the United States proper. (12) Zion National Park (created 1919), in southwestern Utah, has the magnificent gorge of Zion Canyon. (13) Mesa Verde National Park (created 1906) in southwestern Colorado, of 77 sq. m., has the most notable prehistoric cliff dwellings in America.

The national parks are under the control of the Secretary of the Interior, who administers them through the Director of the National Park Service. Each national park is immediately in charge of a superintendent. In order that the national parks may be available for the enjoyment of the public, as provided in the organic act of Aug. 25, 1916, establishing the National Park Service, hotel, lodge, and transportation service are provided by private persons or companies on franchise or permit from the Department of the Interior.

With respect to ownership: The public land within the boundaries of a national park is reserved as the permanent property of the government from all forms of appropriation. Many of the parks, however, include within their boundaries tracts of private land which were sold or granted by the government before the reservation for park purposes was made. With respect to civil and criminal

jurisdiction: Since the Federal government is the land owner of all the parks, it may pass laws to protect its ownership from trespass, and enforce them in the Federal courts through the agency of park rangers, etc.

By the act 'for the preservation of American antiquities,' approved June 8, 1906, the president is authorized to reserve by proclamation as National Monuments public lands containing 'historic landmarks, historic and prehistoric structures, and other objects of historic and scientific interest.' Fifty-seven such reservations have been made by presidential proclamation of which 32 are under control of the Interior Department, 15 are administered by the Forest Service of the Department of Agriculture, being located within national forests, and 10 are under control of the Secretary of War. The most notable of all, the Grand Canyon in Arizona (806,400 acres), enclosing the most wonderful portion of the Grand Canyon of the Colorado, which has been eroded in the course of ages to the depth of a mile below the surrounding plateau, in 1919 was admitted to the National Park system. The marvellous scenic effects are, of their kind, unparalleled in the world. (See Grand Canyon of the Colorado.)

As containing scenic wonders, Zion National Park, in Utah, and the Pinnacles National Monument, in California, are interesting. As objects of scientific interest, protected by this act, are the Natural Bridges of Utah, the Petrified Forest of Arizona, the Devil Postpile of California, and Mount Olympus in Washington (299,370 acres). As historic landmarks may be mentioned the El Morro National Monument, in New Mexico; the Tumacacori National Monument, in Arizona. Many ruins of interest to American archeologists have been preserved, among which are Casa Grande, Montezuma Castle and Navajo National Monuments, in Arizona, and Gila Cliff Dwellings National Monuments, in New Mexico.

**National Republican Party**, a short-lived political party in the United States, which took part in the presidential campaign of 1832. In December, 1831, the National Republican Party for president nominated Henry Clay, who was decisively defeated by Jackson; and in 1834 the National Republicans fused with the Anti-Masons and others to form the Whig Party.

**National Road, Cumberland Road**, or **Great National Pike**, a famous American highway, originally planned to extend from

Cumberland, Md., to St. Louis, Mo. Begun 1806, its completed length was about 800 m.

**National Socialist or Nazi party**. The party of Hitler and his associates in Germany, organized at Munich in 1919. It has its own labor front, its own youth organization, and its own troops.

**Nativity**, a name given to the season of Christmas, especially as a church festival. (See CHRISTMAS.) The Nativity, or birth of Christ, has been one of the most popular subjects of Christian art from the earliest Christian times. Among the famous painters and sculptors who have depicted the subject are Giotto, Duccio, Fra Angelico, Lippi, Ghirlandajo, Botticelli, Tintoretto, Correggio, Van der Goes, and Dürer.

**Natrolite, Needlestone, or Needle Zeolite**, is a hydrated sodium and aluminum silicate belonging to the zeolite group, and having the formula  $\text{Na}_2\text{Al}_2\text{Si}_2\text{O}_{10}\text{H}_2\text{O}$ . Natrolite is a common secondary product after minerals of the nepheline group, and is found filling cavities in igneous rocks.

**Natron**, a hydrous sodium carbonate, having the formula  $\text{Na}_2\text{CO}_3\cdot 10\text{H}_2\text{O}$ , and crystallizing in the monoclinic system. It occurs in nature only in solution, as in the *Natron* or *Soda Lakes* of Egypt and elsewhere. They were the source of the soda salts used by the ancient Egyptians in embalming.

**Nattier, Jean Marc** (1685-1766), French painter, was born in Paris. He painted portraits of Peter the Great and Catherine, his wife. He was perhaps the most famous French portrait painter of his time, his subjects being mostly confined to women of prominence. His portraits include Mlle. de Lambesc (Louvre), Mlle. de Clermont (London), and the Princess de Condé (Metropolitan Museum, New York.)

**Natural Bridge**, a celebrated structure in Rockbridge County, Va., bridging the stream known as Cedar Creek. It is about 215 ft. high, from 50 to 150 ft. wide, and has a span of 90 ft. at its broadest part. It is crossed by a public road.

**Natural Gas**, an inflammable gas, or mixture of gases, produced by the natural distillation of organic matters that have been buried in the strata of the earth. Two types are generally recognized. *Dry gas*, which forms the bulk of the commercial product. *Wet gas*, or *casing-head gas*, is produced from oil wells in association with liquid petroleum. The chief fields in the United States are found in New York, Pennsylvania, Ohio, West Virginia, Kentucky, Wyoming, Arkan-

sas, Kansas, Oklahoma, Louisiana, Texas, and California.

Natural gas is used extensively for industrial purposes, and for heating and lighting in private homes. As a fuel, it has excellent calorific power, ranging from 920,000 to 1,250,000 B.T.U. per 1,000 cubic ft., and is cheap and convenient. The fields in the United States are estimated about 10,000 sq. m. in extent.

**Natural History**, in its widest and oldest sense, includes all the concrete sciences, but psychology and sociology have been eliminated at one end of the series, and physics and chemistry and all their branches at the other, with the result that natural history has become synonymous with the science of living things.

**Naturalism**, in Literature and Art, a professed reproduction only of observable facts, selected under no moral or æsthetic prejudice, and therefore not distorted from truth. It is usually identified with Realism, and contrasted with Idealism, and in literature with Romanticism.

**Naturalization** is the process by which the privileges of citizenship are conferred upon aliens. In order to be naturalized in the United States, an alien (eighteen years of age or over) must file a declaration of intention to become an American citizen, and after a continuous residence of at least five years, he must file a petition for citizenship. The next step consists of a hearing in open court, when the applicant is examined in English by the judge. If this examination is satisfactory, the court admits the applicant to citizenship and the oath of allegiance is administered. As a final step, the clerk of the court issues to the new citizen a certificate of naturalization.

The naturalization of a father confers citizenship on the minor children residing in the United States. Formerly it carried with it, also, the naturalization of the wife, but in 1922, a law was enacted by Congress providing that the citizenship status of a married woman should no longer follow that of the husband, but that she should have the privilege of naturalization, on compliance with the requirements, on her own account. Important amendments to the law were approved March 2, 1929; July 3, 1930 (relating to naturalization of women who have lost their U. S. citizenship, etc.); May 25, 1932 (allowing deported aliens to re-enter the U.S.).

**Naturalization. U. S. Bureau of**, a bu-

reau of the Department of Labor. Originally a division of the Bureau of Immigration and Naturalization, it was raised to the rank of a bureau when the present Department of Labor was created, March 4, 1913.

**Natural Law**, historically, a translation of *jus naturale* in Justinian's *Institutes*; there used as equivalent to *jus gentium*, or Law of Nations. That is defined as 'what natural reason appoints for all mankind,' discriminated from each people's civil law; but this was a misunderstanding due to Greek philosophy. The error was both momentous and fortunate; and the phrase has been a social and institutional force of great energy and efficiency through both positive law and public feeling. In Rome, early *jus gentium* was the skeleton law used in cases involving foreigners; taking from both native and foreign codes their common elements, and omitting local specialties. The great lawyers of the Empire in the 2nd and 3rd centuries fused this 'common law of the world' (Ritchie) with the theory of a natural law underlying it and all actual systems; and their writings made part of the great codifications under Justinian.

The ideas of natural right and law have deeply modified all modern policies and politics. The most influential single source of these was Locke, through his *Treatise on Civil Government* (1689). But Christian philosophy necessarily added to the old materials an ultimate derivation of everything from God's will. Not till recent times was the theory seriously assailed; then on two main lines from three powerful authors. Hobbes, in his *Leviathan* (1651), Montesquieu, in *Esprit des Lois* (1748), and Bentham. In three great fields it has transformed not only social speculation, but largely social life itself: In politics, In social life, In law.

**Natural Theology**, the science which treats of the evidence for the existence of God revealed by nature. Natural theology was represented in Great Britain by Paley, and in Germany by Wolff.

**Nature Study** is the simple observational study of common natural objects and processes, for the sake of personal acquaintance with the things which appeal to human interest directly, and independently of relations to organized science. It should be differentiated from *natural science study*, which is the close, analytical, and synthetical study of natural objects and processes, for the sake of obtaining knowledge of the general principles that constitute the foundations of

modern science. The history of nature study in the schools of the United States and of Europe is closely connected with the development of the laboratory method of teaching all natural sciences. It is practically the extension of the scientific method of studying nature by individual observation and research, which began with the scientists, and by them has been applied in college teaching, and in turn has been adapted to secondary and elementary classes. Nature study is already well established in many of the local school systems of the United States, Canada, and Europe. In America there is a decided tendency toward the agricultural application of nature study; and school gardens, which at first were conducted without much attention to educational processes, are in many instances being made into diminutive farms.

**Nature Worship**, or **Naturism**, is the worship of one or more of the powers of nature. This general cult has manifested itself in a variety of forms. The anthropomorphic tendency, which seems innate in the human mind in its dealings with the unknown, has led to the frequent personification of the more obvious natural forces.

**Naucratis**, Greek trading settlement in ancient Egypt, founded by Milesians about 640 B.C. It was celebrated for its artistic pottery.

**Nauheim**, or **Bad-Nauheim**, watering place, Germany, in Hesse, 24 m. by rail n.e. of Frankfort-on-Main. Its saline springs, ranging from 86° to 95° F., attract large numbers of invalids, especially those with cardiac disease. Nauheim has given its name to the 'Nauheim Treatment,' consisting of mineral baths combined with systematic exercise.

**Naupactus**, ancient Greek city on the Corinthian Gulf. Philip of Macedon captured it from the Achæans in 338 B.C. Its modern name is LEPANTO.

**Nauru**, or **Pleasant Island**, one of the Marshall Islands in the Pacific; area 8 sq. m. Since World War I it has been administered by Japan as mandatory. It has the largest reserves of high-grade phosphates in the world.

**Nausea**, a distressing sensation referred to the stomach. It most commonly accompanies disease or disorder of the stomach, but is sometimes an indirect symptom of disease of some other part of the body.

**Nausicaa**, in ancient Greek story, the daughter of Alcinous, King of the Phæacians. When Odysseus was wrecked on the coast of Phæacia, he found her playing ball on the

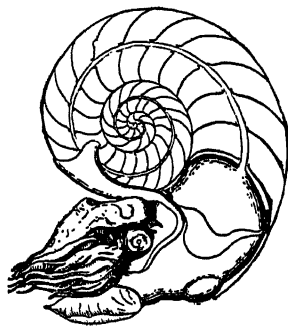
shore, and from her learned how to approach her father.

**Nautch Girls**, dancing girls in India and the East Indies. Dressed in skirts of scarlet, their performances constitute a principal part in the spectacular entertainment called a *nautch* or *natch*.

**Nautical Schools**. In the United States, besides the Naval Academy, where a regular four-year course of instruction in naval science is given, the Navy Department maintains a number of nautical schools to which recruits who show ability are sent to receive education along special lines. They include the four shore Training Stations at Newport, R. I., Hampton Roads, Va., Great Lakes, Ill., and San Diego, Cal., the Navy Electrical School, at the Brooklyn Navy Yard; Seaman-gunner schools, at the Washington Navy Yard, and the Naval Torpedo Station, Newport, a post-graduate School of Marine Engineering, at the Naval Experiment Station at Annapolis.

In all of these schools the students receive the regular pay of their rating while pursuing their studies, and are allowed special furlough privileges before returning to active service.

**Nautilus**, a remarkable mollusc in the class of Cephalopods, the only surviving member of a race once abundant. The outside of the shell is covered with a thin organic layer, beneath which there is a porcelain-like stratum with bands of color, while internally the lime



*Nautilus*

has the usual mother-of-pearl structure, the luster of which, often artificially exposed by the use of acids, has earned for the animal its common name of *Pearly Nautilus*. The species best known is *Nautilus pompilius*, but there are probably four or five others, inhabiting the Pacific Ocean, Indian Ocean, and other warm Eastern seas.

**Navaho, or Navajo.** The Navahos now occupy a reservation of about 500,000 acres, extending into Northeastern Arizona, Northwestern New Mexico, and Southeastern Utah. The general culture of the Navahos is similar to that of the Pueblos; but there are some striking differences, particularly as to dwellings. Instead of the peculiar storied structure of the Pueblo, the Navaho house, or 'hogan,' is a conical construction of poles stood on end and covered with earth, with a low, projecting entrance porch at one side, and a smoke hole at the apex. The tribe is best known for its blankets, ponchos, rugs, belts, garters, and saddle girths. They have also acquired from the Spaniards the art of working silver. The Navahos are remarkable in being the only Indian tribe which has increased in numbers.

**Naval Academy, United States,** the Government school where young men are trained for positions as commissioned officers of the Navy, was founded by Secretary of the Navy, George Bancroft in 1845. It occupies a tract of more than 200 acres on the banks of the Severn River at Annapolis, Md. The course of instruction is specialized on the requirements of the naval service. Applicants for admission to the Naval Academy must be between the ages of 16 and 20 and unmarried, and must pass rigid mental and physical examinations. On admission he is rated as a midshipman, and receives pay at the rate of \$780 per annum from the date of his admission. Midshipmen are graduated (since 1912) with the rank of ensign. Beginning with the year 1928 a limitation on appropriation reduced the number allowed for the Vice President, Senators, Representatives, and Delegates from five to four, to two from the District of Columbia instead of five, and to four from Porto Rico.

Until 1898 most of the Academy buildings were old and inadequate. In that year an elaborate plan of reconstruction was approved by Congress, at an expenditure of \$12,000,000. The new Academy was completed in 1908, and is one of the finest and best equipped naval colleges in the world.

**Naval Disarmament Conference.**—The London Conference for the limitation of naval armaments, which met in the British capital from January 21 to April 22, 1930, resulted in a treaty the important provisions of which were signed by the United States, Great Britain and Japan, who agreed to limit all categories of naval vessels for a period of six years, or until December 31, 1936.

France and Italy, whose representatives also participated in the negotiations, were unable to reach agreement on issues of vital importance to them alone, and consequently signed only those provisions relating to capital ships and technical regulations.

The London Conference was the third important international gathering to deal with the subject of naval armaments since the Great War. At the Washington conference of 1921-1922, the same five powers succeeded in reaching an agreement limiting capital ships and aircraft carriers, but not restricting auxiliaries, such as cruisers, destroyers and submarines. The tonnage levels laid down at Washington for battleships and aircraft carriers were in the ratio of 5-5-3 for the United States, Great Britain and Japan, respectively, and 1.67 for both France and Italy. The Geneva conference of 1927 adjourned without result.

The continued competition in the building of ships not limited by the Washington Treaty, particularly cruisers and submarines, had created a situation which by the end of 1928 was viewed with concern by each of the three principal naval powers. Preliminary negotiations between the United States and Great Britain began in the early summer of 1929. At that time it was announced that the differences between the two countries, which had been so great as to prevent agreement at the Geneva Conference of 1927, had been virtually eliminated. Preliminary negotiations between France and Italy failed to adjust the differences between these two countries. The opening plenary session of the London Conference met in the Royal Gallery of the House of Lords on the morning of January 21. The American delegation was composed of Henry L. Stimson, Secretary of State, chairman; Hon. Charles G. Dawes, Ambassador to the Court of St. James; Hon. Dwight W. Morrow, Ambassador to Mexico; Hon. Hugh Gibson, Ambassador to Belgium; Hon. Charles Francis Adams, Secretary of the Navy; Senator David A. Reed; and Senator Joseph T. Robinson.

Strenuous efforts were made to include all five powers in the agreement limiting navies, but in the end it was found impossible to reconcile the divergent views of France and Italy, and the conference unanimously recommended that this part of the treaty be signed by Great Britain, the United States and Japan. Throughout the conference Italy insisted upon the right to 'parity' with France, a demand which the French delega-



*U. S. Naval Academy, Annapolis, Md*

tion resisted to the end. The conference was thus unable to realize its principal objective: the limitation of all classes of ships of the five principal naval powers. The main provisions of the London Naval Treaty, which was signed by the delegates at the final session on April 22, are as follows:

An extension of the battleship 'holiday,' under which all of the five powers agree not to lay down battleships authorized for replacement under the Washington Treaty before 1936. A limitation agreement, signed by the United States, Great Britain and Japan, established tonnage levels for cruisers, destroyers and submarines beyond which these powers agree not to build before December 31, 1936. A humanitarian agreement, under which the five powers agree that submarines must observe the same rules of international law which govern surface vessels in relation to surface ships.

Efforts to extend the treaty having failed, in the early months of 1937 a revival of naval construction was begun by all the signatories.

On March 25, 1936, a naval treaty at London was signed by Great Britain, the United States, and France, providing maximum tonnage and armament for capital ships, aircraft carriers, cruisers, destroyers, and submarines. It also provided for a holiday in the building of heavy cruisers between 8,000 and 17,500 tons. Clauses likewise provided that the signatories were not bound by its provisions if any power, signatory or not, violated any part of the pact, or in the event of a signatory power being threatened by war. A private agreement was signed on the same date by the United States and Great Britain not to build competitively, and to confirm the principle of naval parity between the two nations.

**Naval Enlistment**, in the United States, is restricted to American citizens, native or fully naturalized. Good moral character and ability to read and write the English language are required, and, in addition, the applicant must pass a rigid physical examination. The term of enlistment is four years.

**Naval Guns.** See **Guns**.

**Naval Institute, United States**, an organization whose object is to publish naval information, was founded at Annapolis in 1873. The membership consists of officers of the Navy and persons holding positions in the Navy Department. About three-fourths of the officers of the Navy are members.

**Naval Manœuvres**, a term, which has

come to signify the larger operations of the fleet in practice. The object of naval manœuvres is the acquirement of skill through the training of actual experience. They are of two classes: Squadron and fleet manœuvres, and Grand manœuvres.

**Naval Observatory, The United States**, the national astronomical observatory concerned primarily with astrometry as distinguished from astrophysics. There are also included in the field of work the preparation and publication of the American Ephemeris and Nautical Almanac and the derivation and dissemination of correct time. The institution, in addition, carries on the important function of arranging for the supply, repair and replacement, as needed, of the nautical instruments and appliances which afford means for safe navigation for United States naval vessels and aircraft.

**Naval Reserve**, in the United States, an organization designed to augment the regular navy in time of need. It was authorized by Congress in 1925 to take the place of the Naval Reserve Force (established in 1916), which went out of existence in that year. It is composed of three distinct classes. Members of the Naval Reserve must be male citizens at least 18 years of age and enlistment is for a term of four years.

**Naval Vessels, Development of.** The warships of antiquity were of the galley type, fitted with beaks for ramming, appliances for grappling, incendiary apparatus, and machines for throwing stones, darts, and other missiles. Naval actions of a decisive character were usually fought hand to hand, as the weapons of the day necessitated. The adoption of the heavy gun materially changed conditions. Ramming was no longer necessary, as the gun could deliver its blow at a distance. Gun-ports came into use early in the 15th century, and the size of ships was greatly increased. In 1815 Fulton's steam man-of-war, the *Demologos*, was launched for the U. S. Navy.

In the long peace which ensued, the development of the steam warships proceeded slowly, and many years elapsed before the transition from sail to steam was completed. The results achieved by the armor-plated floating batteries in the Crimean War (1854-6) demonstrated the possibilities of armored ships, and England and France proceeded at once to build them. The American Civil War brought into practical existence several distinct types: the torpedo boat; a commerce destroyer, the original of the powerful and



swift cruiser, and the revolving turret. Following the type of the torpedo boat, the submarine has been devised to perform the same duty while hidden beneath the surface of the water. The cruise of the United States battleship fleet around the world gave birth to a distinct class of vessels, known as auxiliary, while their names are self-explanatory—colliers, repair ships, and ammunition carriers. The creation of the torpedo boat and the submarine has brought a distinct class of auxiliary vessel into being, known as the parent ship. The war with Spain developed another distinct type, known as the hospital ship. All of these auxiliary types, heretofore utilized only in war have now become recognized as permanent factors of a fleet. The development of aircraft brought about the building of aircraft tenders and aircraft carriers. The types of vessels now in commission in the U. S. Navy include: Battleships; Cruisers; Aircraft Carriers; Mine Layers; Destroyers; Submarines; Gunboats; Destroyer, Submarine and Aircraft Tenders; Repair Ships; Store Ships; Colliers and Oilers; Ammunition Ships; Transports; Hospital Ships; Mine Sweepers and Seagoing Tugs.

**Naval Veterans, National Association of**, a patriotic society, organized in 1887 for the purpose of preserving the comradeship of the *personnel* of the United States Navy in the Civil War.

**Naval War College, The United States**, is located at Newport, R. I. Its purpose is to assist in the training of naval officers for command duties in time of war.

**Navarino**, or **Pylos**, seaport, Greece, in Messenia. The island of Sphagia gives excellent shelter to the harbor, one of the finest on that coast; p. 3,000.

**Navarre**, (Spanish *Navarra*), a province of Northern Spain, the southern part of the ancient kingdom of the same name. The title is now limited to the Spanish province. The valley of the Ebro is fruitful, agriculture flourishes, and rich pasturage supports many cattle. The climate is damp and cold in winter, and very changeable at all seasons. Cereals, wine, fruit, and oil are produced; p. 332,803.

**Navarrete, Martin Fernandez de** (1765-1844), Spanish scholar, is remembered chiefly for his *Coleccion de los viajes y descubrimientos que hicieron por mar los españoles desde fines del siglo XV*. (1825-37), the pioneer history of American exploration.

**Nave**, in architecture, the central part of a church, extending from the front to the

transept, or when there is no transept, to the chancel. Ecclesiastically, the nave is the part of the church assigned to the congregation, the chancel being reserved for the clergy.

**Navies**. The term navy is applied to that portion of the armed forces of a country which operates on the water or in service connected with sea operations, offensive or defensive. We have definite accounts of war vessels antedating all trustworthy descriptions of trading craft. As early as 3000 B.C. the Egyptians possessed war vessels sufficient in number and training to form fleets. The Chinese were navigators in very early times, but the policy of their rulers was opposed to commerce with alien races, and their naval strength does not seem to have been highly developed at any time. The Phœnicians were the greatest sailors of antiquity. In its period of ascendancy the supremacy of Tyre was so absolute on the water that 'a Tyrian Sea' became 'a proverbial expression for a body of water whose navigation was prohibited to all but those who claimed the ownership thereof.' Tyre reached its zenith about the year 900 B.C.

But the Phœnician cities fell before the Assyrians and Greeks, and they, in turn, left the Romans without rivals on land or sea. Notwithstanding their naval successes, they had not taken to the sea from choice and aptitude, but because the command of the sea was indispensable to their plans of conquest and universal dominion. The decline of the Roman Empire opened the way to piracy and robbery by individuals or insignificant states. Eventually the sceptre of naval power passed away from the Mediterranean and into the hands of northern peoples—the English, Dutch, and Northern French. Alfred the Great is commonly regarded as the father of the British navy, as he first combined the naval forces of the petty kingdoms into an English fleet. Henry VIII. improved the navy in all directions and modern naval development may be said to have begun at this time.

At the close of the Napoleonic wars there were but two great naval powers, England and France. In the second rank were Spain, Russia, the Netherlands, and Turkey. In the third were Austria, Denmark, the United States, Sardinia, Portugal, Norway, Sweden, and Prussia. During the next forty years there were no naval operations of importance, but this period was distinguished by the most revolutionary developments in naval material. See **NAVAL VESSELS**, **DEVELOPMENT OF**.

For a decade and a half after the Civil War, the enormous expense of that great struggle precluded expenditures on naval development. In 1881, Congress was prevailed upon to furnish money to commence the building of modern vessels for the American fleet. The demand created by the navy resulted in the development of steel manufacture to a point at which the quality of the American output was at least equal to any steel, armor, or gun forgings obtainable abroad. The reconstruction of the Spanish navy began at about the same time as that of the United States. The success of the United States navy against Spain, in the Spanish-American War, greatly popularized the service, and its subsequent development was rapid until 1901, when the U. S. navy reached second rank, being inferior only to that of Great Britain. In 1910 Germany reached second place, and at the beginning of the Great War in 1914, France had just attained third place. Upon the outbreak of the War in 1914 the German authorities concentrated on the completion of battleships in a vain attempt to challenge Great Britain's enormous superiority in capital ships, and it was not until 1918 that they began to build submarines on a large scale. Under the terms of the Armistice of November 11, 1918, the Germans surrendered all their capital ships and a large number of submarines, the others being destroyed.

Japan began in 1895 the construction of battleships of the first class. After the war with Russia, Japan built rapidly, and became fifth in naval power by 1914, and in 1922 was ranked third. The naval prestige of Russia received a blow in the war with Japan from which it never recovered.

The gigantic two-ocean navy program launched by the U. S. in 1941 included all types of vessels and a great airplane force. Although World War II proved the importance of a large air arm, it proved also the importance of a combination of surface and air arms, and the need for unified control and close coöperation between them; for sea transport, manpower, naval protection, supply and base facilities for aircraft are all essential. See NAVY OF THE UNITED STATES for further treatment of Navies. See NAVAL VESSELS, DEVELOPMENT OF; BATTLESHIP; CRUISER; TORPEDO BOAT; GUNS, NAVAL; SHIP'S COMPANY; SUBMARINES. Consult Cooper's *Naval History of the United States*; King's *Warships of the World*; Pro-

ceedings of the U. S. Naval Institute (Annapolis, monthly).

**Navigation**, the art of directing the course of a vessel from port to port. The Phœnicians, Syrians, Carthaginians, Greeks, and Romans conducted their voyages solely by observations of the heavens, keeping as much as possible to the coast; and little advance was made over ancient methods of navigation until the Middle Ages. In the *Roman de la Rose* (late 13th century) occurs one of the earliest descriptions of the compass, which, probably borrowed originally from the Chinese, was common among Arabian navigators, and was introduced to Europe by the Crusaders. But it was not until the voyages made by direction of Prince Henry of Portugal, often styled 'the Navigator,' after 1418, that navigation seems to have been scientifically applied; and the instruments and sea charts then constructed form the basis of the maritime science of the present day.

An early invention was the cross staff. It was employed for the determination of longitude, by observation of the distance between the moon and some star; and out of it grew the fore staff and the back staff. In 1530 Gemma Frisius of Louvain devised the idea of using watches in conjunction with instrumental observation; and the nautical quadrant in some form was thenceforth part of every ship's furniture. In the early 16th century there also came into use at sea the astrolabe for taking the altitude of the sun and stars. Voyages were conducted at great risk even as late as the 18th century, on account of the lack of instruments for the exact determination of longitude. Mercator's map of the world (1569) was of great assistance to navigators, because on it compass courses are shown as straight lines. Edward Wright, a fellow of Caius College, Cambridge, discovered the true method of dividing the meridian on the charts, and drew up a table for the use of navigators, by which latitude could be determined. He also devised a system of what were called sea rings, from which compass variation, altitude of the sun, and time of day could be determined in any place where the latitude was known.

About 1614 arithmetical as opposed to instrumental calculation was introduced, and about 1620 trigonometry and logarithmic tables were applied to the science of navigation. The modern science of navigation, however, begins with the invention of the sextant in 1731, and the chronometer in 1738.

The sextant is an instrument which measures the altitude of the sun, or a star, above the horizon, thereby determining the latitude of the ship's location. On shipboard the officer using the sextant is said to be 'shooting the sun.' The chronometer resembles a large watch, so suspended that it remains horizontal, in spite of inclinations of the ship. It is a watch, in that it keeps time, thus determining longitude, or distance east or west from Greenwich.

Careful observations under favorable circumstances of weather should determine the latitude within two miles and the longitude within three. The mean of several observations may reduce the error, but not if due to excessive refraction or in the chronometer. The course to be steered is nearly always taken from the chart, though it may be computed. On a Mercator chart the ship's track is a straight line, and can be drawn with a ruler. But owing to currents, winds, shoals, fogs, etc., the track between two distant points is not always a single straight line, but is a broken line made up of several short straight ones. If the distance is over 500 m. and the latitude above 30°, the great circle track is preferred, as it is considerably shorter. To avoid fog, ice, adverse currents, and winds, and to take advantage of favoring conditions on long voyages, the pilot chart and track chart are examined.

When sailing along a coast, a ship's position is found by reference to points of land, lighthouses, beacons, or any prominent marks indicated on the chart. If only one point is available, an approximate position may be found by taking a bearing—noting the direction by compass in which the point lies from the ship—and estimating the distance from it. A more exact position is found as follows: A bearing of the point is taken, and the ship kept on her course for some distance, and then another bearing is taken. These bearings are then drawn on the chart, a parallel rule is placed across them in the direction of the ship's course, and moved to or from the point until the distance between the lines on the chart is found to coincide with that sailed by the ship in the interval. All bearings taken from the compass must be converted into magnetic bearings, by allowing for the deviation, before drawing them on a magnetic chart. If the chart is a 'true' one, the variation must also be allowed for: the amount of variation is marked on the chart. In foggy weather, when it is not possible to take bearings of points, the navigator has to feel his

way along with the lead or sounding machine. The position found in this way is only a rough approximation, and it is necessary to get a series of soundings in order to utilize them to the best advantage. Consult Lecky's *Wrinkles in Practical Navigation* (14th ed. 1903); Muir's *Navigation and Compass Deviations* (1911).

**Navigation Laws.** The name applied to those statutes designed to give to the shipping of the country enacting them either a monopoly or a decided advantage in its carrying trade; and those statutes governing the use of the navigable waters controlled by a state. The first class of statutes has had considerable historical importance. According to the Mercantile System, the control of industry and commerce by the state was within the sphere of the legislator; and colonies existed only for the sake of the mother country. In English history we find a long series of acts between 1381 and 1833 passed to encourage, by the exclusion of foreign competitors, the ships, seamen, and commerce of Great Britain. The principal acts—those of 1651, 1660, and 1663—provided that no goods the product of Asia, America, or Africa might be imported into England or its dependencies in any other than English bottoms; and that goods from European countries might be imported only in English bottoms, or in those of the country of origin of such goods.

In 1661 and 1663 supplementary acts, aimed at the rapidly growing trade of the colonies, defined the colonial products which could be lawfully transported. Other acts concerning trade or navigation and government proclamations of similar import, but of less scope, promulgated between 1663 and 1775, still further restricted foreign and colonial trade with England or with her colonies; and these were among the causes that brought about the American Revolution. The last restriction on the trade of foreign ships in British dominions was removed in 1854, when foreigners were allowed to engage in the coasting trade; but by the Customs Act of 1853, if British ships are prevented from trading in foreign countries similar restrictions may be imposed on ships of those countries in British possessions. The Constitution of the United States gave to Congress the sole power of passing Navigation Acts. See MARITIME LAW; SHIPPING, MERCHANT; TONNAGE; TONNAGE DUTIES; TRADE.

**Navigation, Rules of.** See **Rules of the Road.**

**Navigators' Islands.** See **Samoa Islands.**

**Navy.** See **Navies.**

**Navy Department, U. S.,** a department established by Act of Congress approved April 30, 1798, which provided for an 'executive department to be denominated the Department of the Navy,' and the chief officer therein to be called the 'Secretary of the Navy.' The President is, under the Constitution, Commander-in-Chief of the Navy. He makes recommendations to Congress concerning the Navy, and he participates in naval activities through the Secretary of the Navy, who is in direct charge. There is an Assistant Secretary of the Navy, and a second Assistant Secretary for Aviation. The Chief of Naval Operations has the rank of admiral, while so serving, and is the ranking officer of the Navy. In the absence of the Secretary and Assistant Secretary he exercises the authority of the Secretary of the Navy. He is charged by law with the direction of the operations of the fleet and with the preparation and readiness of plans for its use in war.

The Navy Department comprises 12 bureaus. The *Bureau of Navigation* handles all matters relating to the procurement, training, detail and discipline of *personnel*, officers and men. The *Bureau of Ordnance* has cognizance over all that relates to ordnance and gunnery material, including the gun factory, proving ground and ammunition depots. The *Bureau of Engineering* supervises the designing, building, repairing and installing of the propelling machinery for ships. The *Bureau of Aeronautics* directs all that relates to the design and procurement of aircraft, their maintenance and upkeep, and the organization and administration of active aviation units and air stations. The *Bureau of Construction and Repair* has responsibility for the structural strength and stability of the hulls of all ships, their design, construction, and repair. The *Bureau of Yards and Docks* has charge of all public works, dry docks, wharves, buildings, and grounds. The *Bureau of Supplies and Accounts* procures supplies for the Navy, keeps the accounts and makes all payments of salaries and other disbursements. The *Bureau of Medicine and Surgery* controls the medical corps of the Navy and the hospital service, prescribes physical standards, and makes regulations for hygiene and sanitation. The Major General Commandant of the Marine Corps is responsible to the Secretary of the Navy for the general efficiency, discipline,

and control of the Marine Corps. The Judge Advocate General of the Navy has cognizance of all matters of law arising in the Navy Department. The *General Board* of the Navy is composed of flag officers and is an advisory board which studies naval problems. See **NAVY, U. S.; NAVAL ACADEMY; NAVAL WAR COLLEGE.**

**Navy League, U. S.,** an association incorporated in New York in 1903, its declared object being to acquire and spread before the citizens of the United States, through sections, pamphlets, and otherwise, information as to the condition of the naval forces and equipment of the nation, and to awaken public interest and cooperation in matters tending to aid and develop their efficiency.

**Navy Manœuvres.** See **Naval Manœuvres.**

**Navy of the United States.** The news of the Battle of Lexington had scarcely penetrated to all sections of the Colonies when a party of Maine woodsmen, armed partly with pitchforks and axes, put to sea in a lumber sloop and captured an armed British schooner off Machias, Maine. Their leader, Jeremiah O'Brien, armed his sloop with the captured cannon and put to sea as a privateer, capturing several prizes. His example was quickly followed by others and the coast soon swarmed with the privateers. The exploits and successes resulted in the burning of Falmouth, Me., by the British. General Washington reported the burning of Falmouth to Congress and the next day Congress voted \$100,000 for ships and appointed a naval committee. This first committee bought and fitted out two 24-gun frigates, the *Alfred* and *Columbus*, two brigs, the *Andrea Doria* and the *Cabot*, two sloops, *Providence* and *Hornet*, and the schooners *Wasp* and *Fly* at a cost of \$134,333. On November 10, 1775, the Marine Corps was authorized by Congress and on December 22, 1775, Congress organized the first American fleet. Thus began the Continental Navy.

It suffered from lack of organization, of intelligent direction and control, of specially trained officers, of money, and of suitably equipped ships. Yet in spite of all difficulties the small Navy of the Revolution played a very important part in forcing the Mistress-of-the-Seas to yield American independence, because their ships demoralized British commerce and increased insurance rates, besides causing considerable actual loss and capturing valuable and needed war materials. The prestige of American exploits at sea helped in

inducing open and direct aid from France and Spain. Jones, Barry, Conyngham, Bidle and Wickes founded a sea tradition of which the Navy may well be proud.

Following the Revolution the Continental Navy disappeared. The new ship-of-the-line *America* was presented to France and all other vessels sold. Complete naval disarmament was accomplished in 1785. American foreign commerce increased steadily after the War, and considerable quantities of wheat were shipped to the Mediterranean. The Barbary powers began capturing American ships and by 1793, 13 vessels had been seized by Algeria alone, and 119 Americans were held for ransom, while 7 died in prison. This disgraceful situation finally prompted Congress to authorize the building of 6 frigates. This Act, signed by President Washington on March 27, 1794, marks the beginning of the United States Navy, although it provided that work should be stopped if a treaty were made with the Barbary States. On June 5, 1794, the first officers were selected and commissioned in the United States Navy. In 1795 the Senate ratified a treaty under which a million dollars in ransom was paid to Algeria and an annual tribute of maritime stores to the value of \$21,600 was promised.

President Washington in his 8th message to Congress said: 'To secure respect to a neutral flag requires a naval force organized and ready to vindicate it from insult or aggression.' Washington urged the completion of at least three of the frigates, the *Constitution*, *United States*, and the *Constellation*, which were well under way and this was ordered. The *Constitution* is still preserved at Boston, and the *Constellation* at Newport. The conduct of the French cruisers on the American coast led to further action by Congress, which in April 1798 authorized the President to build, purchase or hire 12 vessels not to exceed 22 guns, and created the Department of the Navy. On July 7, 1798, Congress abrogated all treaties with France and on July 16 authority was granted to complete the three frigates (*President*, *Chesapeake*, and *Congress*), on which work had been stopped.

During the brief naval war with France the Navy as a whole did most creditable work, and the Navy gained prestige, self-confidence and experience. In this war were trained the leaders who later subdued the Barbary powers, 1801-1805. From 1805 until the beginning of the War of 1812 the American Navy was neglected. In consequence the United States was in no condition at that

time to resent the attitude of British war vessels, which stopped American merchant ships and took men from them—oftentimes American-born citizens—on the ground that they were British subjects or deserters, and therefore liable to impressment or reclamation. Instead of resisting these violations, President Jefferson and Congress only made feeble protest.

More gunboats were authorized by Congress and in 1809, the frigates *United States*, *President*, *Essex*, and *John Adams* were ordered into commission. At the same time the *personnel* was also largely increased, and during the next two years the Navy was greatly improved. When it was seen that war was inevitable, it was proposed to lay up the vessels of the Navy to prevent their capture. Fortunately, on the advice of Captains Stewart, Bainbridge, and Decatur, the Navy was given an opportunity to show what it could do; and bravely its capacity was demonstrated in a series of victories over British ships. In 1814 the Washington Navy Yard and the ships there were burned to prevent capture by the British, and the Navy Department, along with the Capitol, White House, library, and other buildings, was burned by the British. Commodore Perry had won spectacular fleet action and his report of the battle, 'We have met the enemy and they are ours—two ships, two brigs, one schooner, and one sloop,' made him a popular hero, but his just claim to fame rests more on his intense energy in building a fleet which within a few months gave the United States control of Lake Erie, the upper lakes, and the adjacent territory. Commodore Thomas McDonough built a squadron on Lake Champlain and won a signal victory, showing unusual skill and judgment in all his thorough preparations for battle and his careful choice of position.

While the War of 1812 was in progress the Barbary powers had seized the opportunity to renew their depredations. As soon as peace was concluded the government decided to punish these pirates so severely that they would never again touch an American citizen or ship. Two squadrons were prepared, one under Bainbridge, who was made Commander-in-Chief, and the other under Decatur. Decatur's squadron arrived in the Mediterranean early in June 1815. Before the month was over he forced the Dey to sign a treaty which gave up all tribute, and bound him to treat Americans with respect and consideration. Similar work was effected at

Tunis and Tripoli. In 1815 the Navy was reorganized, especially as regards administration, and a Board of Navy Commissioners appointed to assist the Secretary. In the same year Captain Biddle, in the sloop-of-war *Ontario*, went to the Pacific Coast, landed at the mouth of the Columbia River, and took possession in the name of the United States. From 1815 to 1830 the Navy was principally engaged in putting down piracy in the West Indies. In 1838 the Department sent out the celebrated exploring expedition under Commodore Wilkes, which spent 4 years in surveying the islands and shoals of the Pacific and the Antarctic regions, during which the Antarctic continent was discovered. On October 1, 1844, the Naval Observatory was established at Washington, and on August 15, 1845, the Naval Academy was founded at Annapolis.

During the Mexican War the Navy established a blockade and operated chiefly as a support to the Army; but in 1846 Commodore Sloat, unaided by troops, took possession of California, and he or his successors in command captured every place of importance on the west coast of Mexico. Between 1852 and 1854 Commodore Perry opened up Japan to foreign intercourse. In 1854 the Navy made the first survey of the Isthmus of Panama, and in 1855 made many surveys in the North Pacific. In 1859 the largest foreign expedition ever sent out by the United States before the Spanish War ascended the Parana River and forced the Paraguayans to recognize American rights. The first steam man-of-war in the U. S. Navy—indeed, it was by many years the first in any navy—was the *Demologos*, completed in 1815. It was more than 20 years later, however, before steam propulsion received serious consideration. From 1840 to 1861, steam vessels became more numerous; but it required the shock of war to force a realization that the day of sailing war-vessels had passed. The operations and events of the Civil War were mostly of a special type, as the Confederates had few seagoing ships.

When the Civil War was over a natural reaction set in. The public debt was enormous for those times; retrenchment was sought in all directions; and the Navy suffered with other public services. By 1881 the Navy had sunk to a position, relative to those of other powers, comparable to the early days of its existence. In 1890 the first battleships were authorized—coast-defense battleships they were called, because Congress had not yet

learned the strategy of naval war. But after these were started the proper sort of ship was appreciated, and seagoing battleships were ordered. The Spanish-American War gave a tremendous impulse to the policy of strengthening the Navy. The accidental immunity of the *Cristobal Colon* in the Santiago fight engendered a popular belief in the armored cruiser class in which a few naval officers concurred. This belief was strengthened by contemporary European practice, and the construction of 13 weakly-gunned armored cruisers, costing almost as much as battleships, was the result. Wireless telegraphy was first put aboard ship by the Navy in 1899, and the name 'radio' was soon afterwards devised and first used by the Navy.

The coming of Theodore Roosevelt to the White House revolutionized the Navy by giving it a prestige and morale it had never enjoyed before in time of peace. Roosevelt had been Assistant Secretary of the Navy, he fostered the development of naval gunnery, ordered the cruise around the world in 1907-8, which brought the fleet to the highest pitch of efficiency, and his influence founded the modern naval power of the United States. With the outbreak of the Great War in Europe the United States was fourth in naval power and agitation for proper naval preparedness began, but it was opposed by the administration, President Wilson telling Congress in his annual message, December, 1914, 'the country has been misinformed, we are not unprepared.' Nevertheless the movement continued and the Naval Appropriation Act of 1915 was more liberal than its predecessors. During the succeeding year the popular demand for greater naval preparedness became more insistent, and called for bringing the Navy to second place in sea power. As a consequence, the Act of 1916 authorized the expenditure of about \$315,000,000. The Act also allotted \$6,000,000 for the further equipment of the navy yards at New York, Boston, Puget Sound, Philadelphia, Norfolk, Portsmouth, Charleston, and New Orleans for the building of ships. By the same Act the Naval Reserve was established on a definite and stable footing, and its organization prescribed.

The Naval Act for 1917-18 was passed before the actual declaration of war by the United States, but at a time when there was no doubt of the final issue. The sum of \$12,000,000 was given to further equip the various navy yards for shipbuilding. For aviation, \$5,133,000 was allotted; for guns, am-

munition, torpedoes, gunpowder, ordnance machinery, ordnance supplies, and ordnance plants, about \$45,000,000. The history of previous wars was repeated. After having developed a navy second only to that of Great Britain the country saved a little money and dropped to fourth place, but even before it entered the war the government saw the necessity of increasing the fleet and was compelled to resort to large and wasteful appropriations. The actual entry into the war brought to the Navy an unusual problem in sea power. The immediate problem for the U. S. Navy was to render aid against the menace of the submarine.

Rear Admiral Sims was sent to London as Naval Representative, and later commanded all United States Naval Forces in European waters. He was instrumental in the adoption of the convoy system for the protection of merchantmen and he asked for and had sent over to Europe nearly all of the 67 destroyers which were then in commission. At home the Navy was faced with a huge task. American merchantmen were armed, and the Navy had to provide guns and gun-crews. Battleships in home waters had to be stripped of many of their broadside guns, and soon the home fleet, to which had been added all the old ships previously out of commission, became a great training squadron, which based principally at Yorktown, Virginia. Recruits were sent to the fleet for intensive training, and the fleet was under constant pressure for the turning out of men for all the varied activities of modern seagoing necessities.

The German merchant vessels in American harbors were taken over, their machinery, which had been damaged by their crews, reconditioned, and the ships manned by naval *personnel*. To meet the special conditions imposed by the submarine menace, the Navy delayed or stopped construction work on new battleships, cruisers, and most of the auxiliaries, and concentrated on destroyers. The destroyers and the transport service shared in the honor of carrying the huge army to France without the loss of a soldier. The naval losses in the war were comparatively small.

The readjustment period immediately after the war was a difficult one for the Navy. The sweeping up of the North Sea mine barrage was as difficult, and much more dangerous than laying it. Bringing the army home was a greater task than taking it over. Placing out of commission the transports, foreign vessels and merchant ships manned

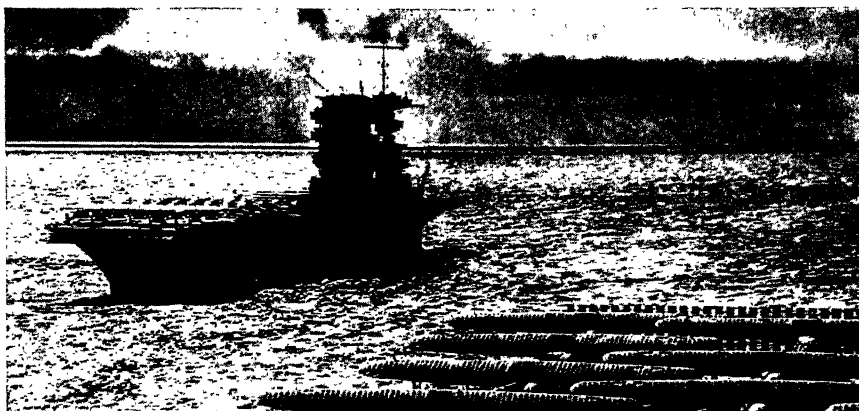
by the Navy, and laying up all the miscellaneous vessels, was a large undertaking, and it was complicated by the desire of officers and men for discharge.

In May, 1919, the Navy made the first trans-Atlantic flight. In 1921 a Bureau of Aeronautics was established in the Navy Department and attention was concentrated on getting aviation 'into the fleet.' Catapults for launching planes from battleships and cruisers were developed, and the battleships began regularly using planes for spotting the fall of shots. Soon afterward aircraft squadrons were organized in the fleet, and each battleship and cruiser was equipped with one or more planes. In 1922 American destroyers took the lead in succoring and evacuating 260,000 refugees at Smyrna. In 1923 naval vessels conveyed aid to the Japanese after the earthquake around Tokyo Bay. In 1927 additional naval forces had to be sent to China for the protection of United States nationals and property there.

In response to an invitation from the United States a conference for the limitation of naval armament met in Washington in November, 1921, attended by representatives of Great Britain, Japan, France and Italy, as well as the United States. At that time the United States was going ahead with the building program authorized before the war, but suspended in favor of destroyer construction until the armistice. The United States proposed an agreement for the limitation of navies on the basis of the then existing strength in the ratio of 5:5.3:1.67:1.67 for the United States, Great Britain, Japan, France and Italy, respectively, all capital ships under construction to be scrapped, as well as all older, obsolete battleships. An agreement was finally signed, in 1922, and ratified, prescribing the above ratios for capital ships, and aircraft carriers. The United States had tried to extend the ratio to cruisers, destroyers and submarines, but the other powers refused to agree. The United States was the host, did all the scrapping of new ships and even added a promise not to fortify Guam and the Philippines, in return for which she received much praise and enthusiastic applause when at the final session it was said, 'This treaty ends, absolutely ends, all naval competition.' Under the Treaty the U. S. scrapped 11 of the 16 battleships and battle cruisers under construction, completed three battleships and converted two battle cruisers into aircraft carriers, Lexington and Saratoga. After the foreign delegations had

gone home, and the applause died away, the United States scrapped her new ships and began to spend large sums for repairs and modernization of the old ones. (See also **LIMITATION OF ARMAMENTS; NAVAL DISARMAMENT.**)

States in the invitations, of extending the provisions of the Washington treaty to cover cruisers, destroyers, submarines and other classes of ships not limited by the first conference. The American delegation proposed a



Five years passed, the tonnage in capital ships preserved the ratio, and although the United States was behind on aircraft carriers all powers were within the agreed limitations for vessels of that type, but in cruisers and fleet submarines the 5:5:3 ratio had become 2.16:5.00:2.73 for the United States, Britain,

new treaty, to supplement the Washington treaty, in accordance with the 5:5:3 ratio limiting naval vessels by total tonnage by classes, in cruiser class, destroyer class, submarine class and providing an exempt class (gunboats, auxiliaries, etc.). The British proposals were extensive and technical, but all



*United States Navy: Upper, Aircraft Carriers, S. S. Saratoga and S. S. Lexington. Lower, Aircraft Carrier U.S.S. Card sets destruction record.*

and Japan. In fleet submarines the disparity was greater, the ratio being 1.36:5.00:4.37. The United States called another conference early in 1927, inviting Great Britain, Japan, France and Italy, as before. France and Italy declined, but delegates representing the other three powers met in Geneva in June, 1927, for the purpose, as expressed by the United

tended towards increasing the potential value of the large British fleet of fast merchantmen. The Japanese proposals gave Japan superiority over the United States in both these classes. The United States would, however, have remained superior in destroyers.

The American press reaction to the British and Japanese proposals was a great shock



to both those nations, and to the British in particular. Remembering the Washington conference, when the United States had done all the scrapping, the British and Japanese had expected the American delegation, press and public to agree to anything. After considerable delay the conference broke up without any agreement of any kind. In 1930 these same five powers met in London, following a conference in 1929 between Premier MacDonald and President Hoover in Washington, D. C. A naval treaty was signed April 22, 1930, which provided for the destruction of certain battleships, and placed limitations upon the tonnages permitted each power. The ratio for this tonnage for the three principal navies, Great Britain, United States, and Japan, is 5:5:3. Regulations were also made to minimize the dangers of war. Japan built ships to the limit of her quota and, since she was prepared to extend her navy, became much dissatisfied with what appeared to be an unfair ratio. In December 1934, Japan, after conversations in London with Great Britain and the United States in a vain attempt to change the ratio of tonnage permitted, threatened to abrogate the Treaty of 1922.

No effective extension having been accomplished of the limitation treaty, which expired in 1936, all the great powers began to expedite naval construction in 1937.

Fighting ability of modern ships is dependent upon so many factors that teamwork has become even more important than in former days. Ships of the different nations are more or less standard commercial products, and any nation may obtain good vessels, if she can pay for them, so that navies now differ little in material power, save in size. The greatest difference is in the character of the *personnel*, the degree of education and training, the practical experience, and the general efficiency of the officers and men. The United States line officers are educated at the Naval Academy, Annapolis, to which they go from all sections of the country. The doctors, and certain other staff officers, enter the Navy from civil life, after passing the required examination. All line officers must have a competent knowledge not only of seamanship, navigation, and gunnery, but also of mechanical and electrical engineering. Many specialize in one of these branches, and are given post-graduate courses of two years. Others take similar courses in ordnance, construction, aviation or radio. As far as practicable, these officers are ordered to duty in which

their special knowledge can be utilized to the full extent. Officers are trained in aviation at Pensacola, and in submarines at New London. There is a post-graduate school at Annapolis, and the Naval War College is at Newport.

The men enlisting in the Navy today are all young men, few are over 22 or 23, and they go to the Navy for the training, education and the opportunity to learn a trade which it affords. After a course at one of the training stations where they learn to care for themselves and their belongings, and to understand the rudiments of discipline, they are sent aboard ship, and after some sea-going experience those who so desire, and who have shown themselves promising material, are sent to various trade schools, for courses. At the end of their four-year enlistment many return to civil life, qualified for some trade, while others remain in the Navy as petty officers, seeking further advancement. The Naval Reserve comprises four main divisions: the Fleet Naval Reserve, composed of officers and men who have served in the regular Navy; the Merchant Marine Reserve, composed of officers and men of the merchant service; the Volunteer Naval Reserve, officers and men interested in the Navy and the sea but ineligible for the two preceding classes; and the Marine Corps Reserve, composed of volunteers and former regulars.

The principal naval force is concentrated in home waters and is organized into the *United States Fleet*, commanded by an admiral. There are four principal subdivisions of the *United States Fleet*—the *Battle Fleet*, the *Scouting Fleet*, the *Fleet Base Force* and the *Control Force*. Three other organizations of fighting craft are maintained under the Navy Department, but independent of the *United States Fleet*. The largest of these is the *Asiatic Fleet*. In Europe the United States maintains a small squadron under the command of a vice-admiral. This force is engaged in the old maritime custom of showing the flag in the various ports of Europe. In the Caribbean and on both coasts of Central America the Navy maintains the '*Special Service Squadron*,' consisting of several old cruisers and gunboats, under the command of a rear admiral, for the protection of American interests, lives and property in the Caribbean and in the troubled States of Central America.

Navy Yards and other U. S. Naval Stations are established under control of the Navy Department which perform various

functions in the maintenance of the Navy in peace and war. Navy yards are stations for the building, docking, and repairing of ships, boats, and aircraft, and for the supplying of fuel, stores of various kinds, and munitions of war. A naval base is a station conveniently located, of ready access, and of ample accommodation for the supply of fuel, stores, and munitions of war of all kinds to a fleet or a subdivision of a fleet, to a destroyer, submarine, or patrol flotilla, or to an aircraft division. Shops for effecting ordinary repairs are necessary; and for the larger bases, docks and repair shops of maximum capacity should be near at hand. Other U. S. naval stations are: training stations, for the instruction of recruits; naval air stations; a gun factory for building guns and mounts; a torpedo station, for the building and repair of torpedoes; a powder factory, for the manufacture of gunpowder; a proving ground, for the testing of guns and armor; naval magazines, for the storage of ammunition; certain radio stations not within the limits of larger naval stations, also radio compass stations, located along the coast, which furnish radio bearings to ships at sea, thus facilitating navigation in fog or thick weather; naval observatories and hydrographic offices.

A navy yard or other large naval station is commanded by a commandant, an officer of high rank. The country is divided into various Naval Districts, the commandant of each district having authority over all naval activities in his district. The principal navy yards are New York (in Brooklyn), extensively equipped, four dry docks, two building ways, in the center of the industrial area and located in the greatest port; Norfolk, well equipped, six dry docks, building ways, convenient to Hampton Roads and the operating base there; Bremerton (Puget Sound), Washington, well equipped, three dry docks (small); Pearl Harbor, Hawaii, being developed as a first class yard and operating base, one dry dock; Mare Island (San Francisco Bay), two small dry docks, suitable yard for smaller vessels, inaccessible to battleships. In January 1943, the United States had 26 battleships, 9 aircraft carriers, 28 heavy cruisers, 54 light cruisers, 404 destroyers, 192 submarines, and various lesser craft; and was building, or had appropriated for, 12 battleships, 11 aircraft carriers, 8 heavy cruisers, 32 light cruisers, 1 mine layer, 193 destroyers and 73 submarines. See NAVY DEPARTMENT, U. S.; SHIP'S COMPANY; SIGNALLING, NAVAL; STRAT-

EGY and TACTICS, *Naval Strategy*; SUBMARINE NAVIGATION; TORPEDO BOAT. Consult J. Fenimore Cooper's *History of the Navy of the United States*; Roosevelt's *Naval War of 1812*, and publications of the U. S. Navy Dept., Washington, D. C. See UNITED STATES NAVY.

**Navy Register, U. S.**, an annual publication of the Navy Department, containing a list of the active and retired officers of the Navy and Marine Corps, giving their rank, order of seniority, time of appointment, length of sea and shore duty, and rate of pay. It also contains a statement of deaths, resignations, and dismissals within the service for the year; a list of the naval stations, with information concerning each; the number of ships in the Navy, with descriptive details; and the squadron organizations. Other nations issue similar publications.

**Navy Yards and Other U. S. Naval Stations.** See *Navy of the United States*.

**Nawanagar**, chief town of Nawanagar state, Bombay, India, and a flourishing seaport. It contains picturesque palaces. Gold and silk embroidery and perfumed oils are manufactured; p. 55,000.

**Naxos**, the largest and most fertile of the Cyclades Islands, part of the Grecian Archipelago, in the Ægean Sea. Area, 163 sq. m. Its chief products are wine, corn, oil, cotton, fruit, and emery. There are marble quarries, worked as early as the 6th century B.C. Naxos, the capital, is on the n.w. coast.

**Naxos**, an ancient Grecian colony on the e. coast of Sicily, founded in 735 B.C., the first Greek settlement in Sicily.

**Nazarene**, a name applied to Jesus from His connection with the town of Nazareth. The term *Nazarenes* was later applied in Palestine to the Christians.

**Nazareth**, a town of Galilee, Palestine, famous as the boyhood home of Jesus. It lay in the midst of a fertile district about half way between the southern end of the Lake of Galilee and the Mediterranean Sea, on the southern slope of Jebel-el-Sikh, a hill 1,600 ft. high, from whose summit a panoramic view of the greater part of Palestine may be had. Joseph and Mary resided here both before and after the birth of Jesus; and the village continued to be the home of Jesus until He began His ministry. There is no knowledge of its early history, nor any mention made of it in the Old Testament. That it was obscure, and possibly of ill repute, is indicated by Nathanael's question, 'Can any good thing come out of Nazareth?' The

Christians of the early period paid little or no attention to Nazareth until the 6th century, when pilgrimages were continuously made to the shrine of the Virgin. It was especially revered by the Crusaders.

**Nazarites** (properly **Nazirites**), a name borne in ancient Israel by those who were consecrated to the Lord. Their vow embraced abstinence from wine, from the practice of cutting the hair, and from contact with dead bodies. The vow might be temporary, in which case its termination was celebrated by sacrifices; but it was sometimes lifelong, as in the case of Samuel, Samson, and John the Baptist (Nazarites from birth).

**Nazi**, name coined for the German National Socialist Labor Party of Germany. The leader of the party is Adolf Hitler, who organized the movement in November, 1920. Its aims are similar to those of the Fascisti organization in Italy. The propaganda minister with control over press, radio and cultural activities is Dr. Josef Goebbels.

**Nazimova, Alla** (1879- ), Am. actress of Russian parentage. Her best roles were in Ibsen's plays; in 1931-32 she appeared in the role of 'Christine' in O'Neill's *Mourning Becomes Electra*. Her debut in English speaking parts was in 1906.

**N. B.** (*nota bene*), 'mark well'; also a contraction for New Brunswick.

**Neagh, Lough**, lake in Ulster, Ireland, the largest in the British Isles. The coast is much indented. Length, 18 m.; average breadth, 11 m. Area, 153 sq. m.

**Neagle, John** (1796-1865), American painter, largely self-instructed, was born in Boston. His picture, *Patrick Lyon at the Forge* (1826), now in the Pennsylvania Academy of Fine Arts, in Philadelphia, is his best-known work. Other portraits of importance are hung in various Philadelphia institutions, and that of Gilbert Stuart in the Boston Athenæum.

**Neander, Johann August Wilhelm** (1789-1850), German Church historian, was born in Göttingen, of Jewish parents (Mendel). Nearly all his principal works have been translated into English. Neander was a tower of strength against the rationalism of his time and joins vast erudition with deep spiritual insight.

**Neanderthal Man**, is the term distinguishing a very low type of European, long extinct, represented by a skeleton found in 1857 in the Neanderthal cave, near Düsseldorf. The skull, which is very thick and unusually large, is dolichocephalic, with a cephalic index of 72

mm.; and is remarkable for its low forehead, its enormous superciliary ridges, and an exceptional projection of the occipital region. Skulls presenting almost identical characteristics have been found in other places since. These remains (except the Heidelberg skull) are referred to the late Pleistocene Age (Mousterian). Evidence from other remains leads to the widely held theory that a more highly developed race, exhibiting the characteristics of modern man, existed simultaneously with the Neanderthal anthropoid type, the latter being exterminated early in the Aurignacian period.

Consult Huxley's *Man's Place in Nature*; Farrington's *Neanderthal Man*, Field Museum. Geology Department, Leaflet No 11 (1929).

**Nea Patra**, or **Hypate**, commune, Greece, in Phthiolis; 11 m. s.w. of Lamia; p. 2,250.

**Neapolis**, ancient name of Naples, Italy.

**Neapolis**, ancient town, the seaport of Philippi, in Macedonia. Cavalla is probably on or near the site.

**Neap Tides**. See **Tides**.

**Near Eastern Question**. See **Eastern Question**.

**Nearing, Scott** (1883- ), American sociologist, was born in Morris Run, Pa. His publications include: *Social Adjustment* (1911); *Poverty and Riches* (1916); *The American Empire* (1921); *The Next Step* (1925); *Education in Soviet Russia* (1926); *Economic Organization of China* (1927); *Black America* (1929); *Twilight of Empire* (1930); *War* (1931); *Free Born* (1932).

**Near Sightedness**. See **Myopia**.

**Neath**, seaport and market town, South Wales. It has copper, tin-plate, engineering, chemical, and ironfounding works, and exports local mineral products; p. 33,322.

**Neat's-foot Oil**, an oil properly obtained by boiling the feet and shin bones of cattle, though horses' and sheep's feet are often substituted. It consists chiefly of oleine, and is of pale yellow color and without odor. It does not easily solidify on cooling, become rancid, or clog, and is a valuable lubricant for finer machinery. It is also used in leather dressing.

**Nebo**, a Babylonian deity, the interpreter of Bel-Merodach, and the patron of literature and science.

**Nebraska**, one of the North Central States of the United States. It is bounded on the n. by South Dakota; on the e. by Iowa and Missouri; on the s. by Kansas and Colorado; and on the w. by Colorado and Wyoming. The Missouri River marks a portion of its northern and all of its eastern boundary line. The total

area is 77,520 sq. m., of which 712 are water surface.

The State consists in general of an undulating plain with a gradual slope from w. to e. In the northern and western parts the surface is broken by chains of lofty hills, which range from 3,500 to more than 5,000 ft. in height. The valleys are shallow, trough-like depressions, varying in width from one-fourth of a mile along the smaller streams to 23 m. along the Missouri and Platte Rivers. The Missouri River, on the eastern border, is the most important. The Platte (or Nebraska), formed by the union of the North Platte and South Platte Rivers, flows across the State from w. to e., and empties into the Missouri.

The climate is characterized by severe winters, unusually warm summers, limited rainfall, and sudden temperature changes. In general the soil is fertile, mellow, and easily tilled.

The mineral production of Nebraska is comparatively small. The chief source of the State's wealth is its agricultural resources, Nebraska ranking as one of the most important States in grain and cattle raising. The principal crops are corn, wheat; hay and forage; oats, and potatoes.

Nebraska's manufacturing interests have been rapidly developing in recent years and it ranks among the foremost States in its output of slaughtering and meat packing products. The development of this industry is due partly to the natural activities afforded for feeding cattle, and partly to its central location in the corn and cattle-raising sections of the country. According to the 1940 Census, the population of Nebraska was 1,315,834. Of this total 13,752 were Negroes, 3,256 Indians, 674 Japanese, 194 Chinese, 6,321 Mexicans, and 55 Filipinos. The population of the principal cities in 1940 was: Omaha, 223,844; Lincoln, 81,984; Grand Island, 19,130; Hastings, 15,145; North Platte, 12,429; Fremont, 11,862; and Norfolk, 10,490.

Among the institutions of higher learning are the University of Nebraska, at Lincoln; Creighton University, at Omaha; York College, at York; Cotner University, at Bethany; Doane College, at Crete; Nebraska Wesleyan University, at University Place; Hastings College, at Hastings; Grand Island College, at Grand Island; Midland College, at Fremont; Union College, at College View; and Central College, at Central City.

The present constitution of Nebraska is that of 1875 as since amended. Under the amendment of 1934, there is only one legislation chamber. It has 43 members, has functioned

since 1937 and has been generally satisfactory. This is the only State in the union having a unicameral legislature. Under the Reapportionment Act, Nebraska has 4 Representatives in the National Congress. Lincoln is the State capital. The present State of Nebraska belonged to that portion of the Louisiana Purchase which in 1805 was organized as the Territory of Louisiana, and which after 1812 was known as Missouri Territory. About 1700 French fur traders ascended the Missouri and in 1739 the Mallet brothers travelled nearly the entire length of the State on a journey from the Missouri River to Santa Fé; and some explorations were made by the Lewis and Clark expedition (1804-06). Early settlements in the territory were trading posts established by the fur traders in their commerce with the Indians. The first of these was at Bellevue in 1810. Fort Atkinson was settled in 1819; Omaha in 1825; and Nebraska City in 1826.

During 1845-50 the plains of Nebraska were the camping ground of Western travellers, including a part of the Great Mormon exodus, United States troops *en route* for the scene of war in New Mexico (then a Mexican province), and a continuous stream of immigrants bound for California in the gold-fever days. After the admission of Missouri as a State in



*Spiral Nebula, in Canes Venatici.*

1821, the Nebraska region remained unorganized for 33 years. In 1854 a bill was passed by Congress, known as the Kansas-Nebraska Bill, which organized the region between 37° and 40° n. lat. as Kansas Territory, and all n. of 40° n. lat. as Nebraska Territory. An act admitting Nebraska to the Union was passed by Congress in 1866, but failed to receive the

signature of President Johnson. The final act of admission was passed over the President's veto and Nebraska was proclaimed a State on March 1, 1867.

In 1882 Congress extended the northern boundary of the State eastward along parallel 43° to the main channel of the Missouri River, adding about 600 sq. m. to Nebraska's area. In 1898 the Trans-Mississippi Exposition was held at Omaha. The constitution limits the State's bonded debt to \$100,000. In 1938 there was no State debt. In 1930 the Omaha Grain Exchange's pit for trading in futures was reopened after being closed for 13 years by Federal authority. In National politics Nebraska has been Republican except in 1896, 1908, 1912, 1916, 1932 and 1936, when the Presidential vote was given to the Democratic candidate.

**Bibliography.**—Consult Bradford and Spidel's *Nebraska, Its Geography and Agriculture* (1931); University of Nebraska's *Nebraska Blue Book* (biennial); publications of the Nebraska State Historical Society; Sheldon's *New Standard History of Nebraska* (1928-29).

**Nebraska, University of**, a coeducational State institution at Lincoln, Neb., founded in 1869. Its organization comprises a Graduate College, College of Arts and Sciences (including the School of Fine Arts), College of Agriculture, College of Engineering, College of Law, Teachers' College, Colleges of Medicine, Pharmacy, Business Administration, and Dentistry, School of Journalism and of Nursing. See **UNIVERSITY**.

**Nebraska Wesleyan University**, a coeducational institution of learning under the control of the Methodist Episcopal Church, located at University Place, Nebraska, founded in 1887. It comprises a College of Liberal Arts; a College of Fine Arts, with Schools of Music, Expression, and Art; a Teachers' College; and an Academy. See **UNIVERSITY**.

**Nebuchadnezzar**, or, more correctly Nebuchadrezzar, the great king of the Chaldeans, was the son of Nabopalassar and after the death of his father (604 B.C.) reigned over Babylon until his own death, in 562 B.C. He succeeded his father in 604; destroyed Jerusalem in 586, exiled about 4,000 Jews, and subdued Tyre after a siege of 13 years; and later invaded and plundered Egypt. He restored to Babylon its former glory. See **BABYLONIA**. Consult Langdon's *Building Inscriptions of the Neo-Babylonian Empire*; Tabonis' *Nebuchadnezzar* (1931).

**Nebula**, a cloud-like sidereal object irre-

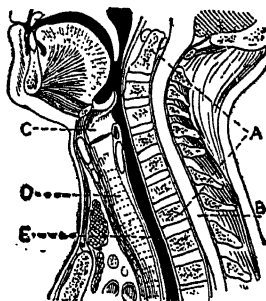
solvable into stars. The great nebular ellipse in the girdle of Andromeda noted in the 10th century, and the 'fish-mouth' formation in Orion observed in 1618, typify respectively the two leading varieties. White nebulae give a faint continuous spectrum. They are mostly elliptical or spiral in structure; and they crowd toward the poles of the Milky Way. Gaseous nebulae were discovered as such by Sir William Huggins in 1864. All the great irregular nebulae, as well as those of planetary and annular forms, are gaseous. See **CLUSTER**.

**Nebular Hypothesis**, a speculation regarding the origin of the planetary system, propounded in an imperfect form by Kant in 1757, and with fuller knowledge by Laplace in 1796. The basic idea was that the solar system had been evolved from a huge nebula which, in the process of cooling, had cast off rings of matter from which the planets were formed. See **COSMOGONY**.

**NEC**, National Emergency Council. A U. S. New Deal agency.

**Necessaries**, in the legal sense, such things as are necessary and proper for man not only to sustain life, but to permit him to live as befits the station in life which he occupies.

**Necessity**, that logical certainty which attaches to a proposition or judgment in virtue of its self-evidence or full demonstration, and which compels us to accept it as true. A distinction, of much importance in the history of philosophy, has been drawn between necessary and contingent truths.



*Diagrammatic Section of the Neck.*

A, Cervical vertebrae; B, spinal cord; C, larynx; D, trachea; E, esophagus.

**Neck.** (1.) In anatomy, that part which lies between the head and trunk. The cervical part of the spinal column, protecting the spinal cord and supporting the head, lies at the back of the neck, covered by masses of muscle for

keeping the head erect or drawing it back. In front, in the middle line, the cartilaginous larynx and trachea can be felt; and behind them lies the soft muscular tube, the gullet or œsophagus. On either side of the middle line lie large muscles for supporting and moving the head, large arteries, veins, and nerves, each side being a duplicate of the other. (2.) In geology, the name given in former volcanic craters to the conduit up which the lavas arose.

**Neckar**, riv. trib. of Rhine, rises between the Black Forest and Swabian Jura, and joins the Rhine at Mannheim, Baden, after a course of 247 m. Stuttgart and Heidelberg are among the cities situated on its picturesque banks.

**Neckar, Jacques** (1732-1804), French financier, was born at Geneva, where he founded (1762) a bank which became one of the most famous in that part of Europe. He managed to restore the credit of the French Treasury for a time; but his economies were more than neutralized by the war with England on behalf of the American Colonies. Necker's dismissal in 1781 made him a popular hero. He was recalled in 1788 and made director-general of finance; but his second dismissal, on July 11, 1789, was one of the direct causes of the attack on the Bastille. He was recalled a second time on July 20, as a consequence of the popular victory; but he was quite unequal to the situation, and resigned in September, 1790. His *Œuvres Complètes* appeared in 15 vols. (1820-1).

**Necromancy**, the practice of the black art, enchantment, and magic in general. See DIVINATION.

**Necropolis**, a city of the dead; especially applied to a cemetery of the ancient world, and to any burying-ground in modern times. The most celebrated necropolis was the so-called suburb of Alexandria, the scene of the suicide of Cleopatra. The only remains are a series of catacombs.

**Necrosis**, in pathology, the death of circumscribed portions only of bodily tissue, most frequently the death of bone. See CARIES.

**Nectar**, the sweet secretion of certain organs present in a large number of flowers, and the source of honey.

**Nectar**, the name given by Homer to the drink of the gods of Olympus, their food being ambrosia. It was red-colored, and mixed with water, like wine. Mortals were not permitted to taste of it, as to drink it conferred immortality.

**Nectarine**, a fruit which is merely a variety of *Prunus persica* (the peach), with a smooth

skin. It is grown in California, chiefly for drying and canning.

**Nectary**, the organ or floral part of a flower whose function it is to produce nectar from the fluids circulating in the plant tissues.

**Needle**, an instrument used to carry the thread in sewing, knitting, embroidery, etc. Needles are now generally made of fine steel, but bone, ivory, and wood are also used. The manufacture of needles is an important industry.

**Needle, Magnetic.** See COMPASS.

**Needles, The**, group of three rocks off w. point of Isle of Wight, England. The original 'needle,' a slender pinnacle 120 ft. high, fell in 1764. They were formerly connected, but the sea pierced them before 1820.

**Needlework.** In sacred writings frequent mention is made of needlework. Aholiab, of the tribe of Dan, celebrated as a skilled embroiderer, was chosen to execute the beautiful hangings of the tabernacle. Tents occupied by primitive man were embellished with devices in needlework. The Greeks attributed the invention of needlework to Minerva, and Grecian women excelled in the art. The early Britons were accomplished in needlework, for Boadicea, on the day of her defeat, wore a richly-embroidered mantle. Tapestry—a combination of embroidery and weaving—played a prominent part at this period. The historical Bayeux tapestry worked by Queen Matilda is one of the most celebrated specimens.

During the reign of Charles I. hangings and furniture were worked in woolen crewels—a style which found favor until the reign of Queen Anne. After that followed revivals of colored embroideries executed in wools and silks of curious designs, and cross-stitch samplers, on which were represented alphabetical letterings, quaint devices, landscapes, trees, and flowers. Then came Miss Linwood with her celebrated series of 64 pictures in needlework. During the early Victorian era a popular form of embroidery was the open-hole cambric work, which has been revived recently. Tambour work, designs darned on coarse net, and plain and ornamental netting, were also in vogue. Appliqué work, in which designs cut out in one material are placed on to a contrasting fabric, and the edges secured by buttonholing or by braiding, also found favor. Berlin-wood work, which is cross-stitch worked in wools on canvas, and in most elaborate designs, embellished footstools, hand-screens, and other articles of furniture. Then came crewel work, a most inartistic and crude revival of embroidery in wools. The establish-

ment of the Royal School of Art Needlework at S. Kensington in England in 1872, and the constant encouragement extended in high quarters to the reinstating of needlework as a fine art, have resulted in remarkable improvement of design and treatment. A description of raised embroidery in white cotton, applied to linen articles, is very effective, and is known by the name of Mountmellick work.

Russian cross-stitch, worked in colored threads on soft canvas fabrics, or applied to linen by means of working over stiff canvas attached to the linen, and withdrawing the canvas threads after the design is worked, is executed in elaborate designs. Church embroidery shows much painstaking and very beautiful work, different in treatment from any other style of artistic needlework. Of recent years needlepoint embroidery done in wool on canvas has again become very popular.

**Negapatam**, munic. tn. and chief port, Tanjore dist., Madras, India; one of the earliest settlements of the Portuguese on the e. coast. It was taken by the Dutch in 1660, and by the British in 1781. Oil is extracted, and here are the workshops of the Great Southern Railway; p. 57,190.

**Negligence**, in law, is the omission to do something which a reasonable man would do, or doing something which a prudent and reasonable man would not do. The person who complains must prove negligence on the part of the defendant, and that he has suffered harm as the reasonable and probable consequence of that negligence. But even if the defendant has been guilty of negligence, if he can prove that the harm sustained by the plaintiff could have been avoided had the plaintiff himself exercised reasonable care, then the defendant will not be held liable. This is the doctrine of 'contributory negligence.' In some states the plaintiff must prove that he was free from negligence as a part of his cause of action. A man is liable not only for his own acts, but also for the acts of others employed by him so long as they do not go beyond the scope of their authority. (See also EMPLOYERS' LIABILITY.) If a man undertakes by contract, express or implied, to perform some service that requires special skill or knowledge, he will be liable for negligence if he fails to exercise adequate skill or knowledge. The neglect of duties imposed by law upon various persons for the preservation or protection of life involves criminal responsibility in the event of some one being injured or killed. Negligence is, generally speaking, a

question of fact for the jury acting under instructions from the court as to the law applicable to the facts in issue.

**Negotiable Instruments**. In its broadest sense this term includes all instruments in writing which are obligations to pay a certain sum of money at a fixed or determinable time, or which represent property, and which may be transferred from one person to another by endorsement and delivery, or by delivery alone, so as to vest in the transferee all the rights thereunder that the transferor had at time of delivery. However, in law, the term is now technically applied exclusively to instruments which, calling for the payment of money, if transferred before maturity vest in an innocent transferee the absolute right to demand payment for the whole amount named therein, with interest, if any, irrespective of any defenses which may have existed as against his transferor. The idea of negotiability carries with it this safety in accepting obligations which on their face purport to be valid. Bills of exchange, promissory notes, and checks are strictly negotiable in all jurisdictions, and in some states certificates of deposit, coupon bonds, and other obligations for the absolute payment of money have been held negotiable. The New York Negotiable Instruments Act provides: An instrument to be negotiable must conform to the following requirements: It must be in writing and signed by the maker or drawer. It must contain an unconditional promise to pay a sum certain in money. It must be payable upon demand, or at a fixed or determinable future time. It must be payable to order or to bearer, and where the instrument is addressed to a drawee, he must be named or otherwise indicated therein with reasonable certainty. It may be written with lead-pencil. The law merchant governs where the act contains no provisions on a point.

**Negri Sembilan**, British protectorate of federated Malay states, n. of Malacca, in the Malay Peninsula. Rice, tapioca, india-rubber, coconuts, fruits, and spices are cultivated. Liberian coffee is grown. Tin-mining is important; gold and other minerals are also found. The chief town is Seramban. The inhabitants are Sumatran Malays. Area 2,580 sq. m.; p. 290,369.

**Negrito**, or **Negrillo**, a term applied by the early writers to the undersized black aborigines of the Philippine archipelago, and gradually extended to the similar groups in other parts of Oceania and also in central and Southern Africa.

**Negro**, a name given to the principal race inhabiting Africa. The term *Negroids* is usually applied to all the dark-skinned inhabitants of the tropical and sub-tropical zones. The true negro, occupying the region between 10° n. lat. and 20° s. lat., is characterized by black skin, woolly black hair, flat nose, protruding lips, a prognathous skull form.

The negro people, according to Sir H. H. Johnston, did not originally have their present extensive African range. About 1000 B.C., all of Africa south of the Congo forests was inhabited by the dwarfish Bushman peoples. The Bantu-speaking negroes at this time began an expansion down the east coast of Africa into the southern part of the continent.

The black man, the Bantu or true negro, is the most important and the most extensive representative of primitive, or pre-literate, man. Their communities are small, the political organization simple. Agriculture, hunting and fishing are extensively practiced. In the arts, weaving and the making of pottery have been developed. The negroes are thought to be the first people to develop iron smelting and working.

Negroes are found also in the U. S., the West Indies, Brazil, Peru, the Cape Verde Islands, and Arabia. Hayti and Liberia are the only two negro countries that are politically independent. In the U. S. there are c. 13,000,000 negroes, largely the descendants of slaves imported from Africa, although there has been a considerable immigration from the West Indies. See **AFRICA**; **NEGRO EDUCATION**; **NEGRO PROBLEM**; Stow's *The Native Races of South Africa*; L. Levy-Bruhl's *Primitive Mentality* (1923).

**Negro, Rio**, river, Argentina, formed by the junction of the Neuquen, which rises in Lake Malbarco, and the Limay, which has its source in Lake Nahuel-Huapi. The Negro flows e. and s.e. and enters the Atlantic after a course of 625 m.

**Negro Education.** The education of negroes in the U. S. began with the work of English missionary societies, started at an early date for the Christianizing of the Indians and negroes. The Society for the Propagation of the Gospel in Foreign Parts established a school for negroes in Charleston in 1745. The St. Francis Academy for colored people was established in 1829, in Baltimore. The Society of Friends in 1837 established what is now the Cheyney Training School for Teachers at Cheyney, Pa. In 1854 the Presbyterians established at Hinsonville, Chester

co., the Ashmun Institute, since 1866 known as Lincoln University. In 1856 Wilberforce University near Xenia, Ohio, was established. In 1863 this institution passed wholly into the hands of the African M. E. Church.

The abolitionist movement led the Southern people to fear that they were in danger of a negro revolt, and laws were passed making it a penal offense to teach a negro. The first school for the freed negroes was opened (1868) under the auspices of the American Missionary Association at Hampton, Va., where many free negroes had been gathered under the protection of Gen. B. F. Butler. Here, after the close of the war, Gen. S. C. Armstrong opened a school for 1,500 colored children. This school, the Hampton Institute, has been the most influential institution, if not factor, in the education of the race. (See **HAMPTON NORMAL AND AGRICULTURAL INSTITUTE**).

The Freedmen's Bureau, organized March 3, 1865, devoted much attention to education; it established 4,239 schools, was maintaining 2,677 schools in 1870. In 1870, when the educational activities of the Bureau were turned over to the American Missionary Association, it was teaching 149,581 pupils.

The American Missionary Association continued to be the most important factor in the education of the negroes, but the Northern Protestant denominations soon directed their efforts through denominational missionary societies. Howard University (Washington, D. C.), Hampton Institute (Virginia); and Atlanta University (Georgia), together with Tuskegee, Alabama, an offspring of Hampton, have been the most important educational institutions for the colored race.

Shortly after the war several Southern cities, notably Charleston, S. C., established public schools for the negroes, and the reconstruction governments, in organizing public school systems, provided for the education of the colored population. A number of educational funds have been established by individuals to assist in the work of education, the chief benefactors being Daniel Hand, of Guilford, Connecticut, Daniel Peabody, of Danvers, Mass., John F. Slater and Caroline Phelps Stokes. Julius Rosenwald, of Chicago, also made important benefactions to assist the negro.

In 1930 there were 2,802,987 colored children from 5 to 17 years of age inclusive s. of the Mason and Dixon line of which 2,198,823 were enrolled in elementary and secondary



schools. Of the population of ten years and over the percentage of illiteracy shown by the Census of 1930 was 4.3 per cent; in 1920 5.9 per cent and in 1910 7.7 per cent. There are now 22 publicly supported institutions under state government and control; 31 universities and colleges privately owned and controlled by Northern white church boards; and 17 privately supported by Negro church organizations.

**Negro Problem**, a term loosely applied to the various questions, social, political, and economic, arising out of the emancipation of the negro slaves.

The negro problem became acute in America during the period of reconstruction, when the dominant party in the North sought to assure to the emancipated slaves, through the war amendments and civil legislation, all the rights enjoyed by their former masters. Only by the ballot, they believed, could the negro defend himself against virtual re-enslavement.

With the withdrawal of the Northern troops from the South the white population regained control of the State governments, and virtually disfranchised the mass of the negroes, at first through intimidation and other illegal practices, later through constitutional amendments. As a result, in a great part of the South the negro is no longer a political factor. Indirectly, however, the presence of a vast body of negro citizens has had the effect of forcing the whites to act together under a single political party opposed to the extension of the suffrage to the negro.

In 1895 Booker T. Washington, who founded Tuskegee Institute, delivered an address at Atlanta which attracted national attention. In this address he proposed what was regarded as a compromise for a partial settlement, or armistice, between the races. His doctrine was expressed in the epigram, 'We can be as independent as the fingers and as one as the hand,' suggesting in this figure the social separation of the races, and their economic co-operation. The Third Pan-African Congress was held in London in November, 1923, and resolutions were passed asking for the negro a voice in his own government, free elementary education, the development of Africa for the benefit of Africans, world disarmament, or, failing that, the right of blacks to bear arms in their own defence, and the organization of commerce for the benefit of the many. This Pan-African Congress represented the intellectuals and the educated, the so-called 'talented tenth' of the negro race.

The result of the negro's conflict with the

white has been greatly to intensify the race consciousness of the negro, which was further enlarged by his experience in World Wars I and II. This sentiment has found expression, among other ways, in a group of writers of vigorous prose and poetry, who have undertaken to voice the wrongs of the race. Among the more recent poets may be mentioned James Weldon Johnson, Countee Cullen, Claude McKay, and Langston Hughes.

Important also is the Negro's contribution to both drama and music. There has been an awakened national interest in the Negro drama occasioned by the production of *The Emperor Jones* and later by such plays as *Porgy* and *Green Pastures* in which all the parts were taken by negroes. In music the Negro spirituals constitute one of the finest bodies of folk songs in the world and Roland Hayes, Paul Robeson, and Marian Anderson are among the most popular singers on the concert stage. The blues and ragtime are also of negro origin and constitute the elements of jazz.

During the Great War immigration from Europe was largely shut off. As a result, industrial concerns, largely located in the North, experienced a labor shortage, which was partly met by negroes from the Southern States and the West Indies. The migration of the negro in considerable numbers into urban centers provoked a number of race riots of more than usual magnitude. A riot of extraordinary violence took place in Tulsa, Oklahoma on May 31 and June 1, 1921. During World War II, in the summer of 1943, serious race riots occurred in Detroit, Mich., and in Harlem, N. Y., which resulted in numerous deaths and injuries and much property damage.

The first dispassionate study of one of these riots, and the underlying causes, was that of the Chicago Commission on Race Relations, published in 1922, under the title *The Negro in Chicago*. In this connection, mention may be made also of a serious phase of the race problem discussed at greater length under another heading (see *LYNCHING*). In 1932 the Alabama supreme court upheld the sentence of death on nine Negroes found guilty of rape in the famous Scottsboro case. In 1937, after much legal procedure, four of the defendants were given long term prison sentences, and one received a death sentence, which in 1938 was commuted to life imprisonment. Cases against the others were dropped.

As might be expected the negro has shown great success in the undertaking where he has had some experience, namely, agriculture, especially the growing of cotton. In the

Southern States, the Negro has continued to be employed almost exclusively in occupations requiring a small degree of skill. In the North, however, each year sees an increasing number of new trades and professions in which Negroes are found. In 1866 there were 4,000 Negroes in business while in 1939 there were over 70,000 Negro business establishments.

During World War II—a war being fought for the freedom of all peoples, everywhere—race and color became a global instead of a national problem.

**Bibliography.**—Consult W. E. B. Du Bois' *Black Folk Then and Now* (1939); Booker T. Washington's *Up From Slavery*; E. R. Embree's *Brown America* (1931); Benjamin G. Brawley's *The Negro Genius* (1937); J. S. Redding's *No Day of Triumph* (1942); Rackham Holt's *George Washington Carver, An American Biography* (1943); Roi Ottley's *New World A-Coming* (1943).

**Negros**, one of the Philippine Islands, in the Visayas group between Panay on the n.w. and Cebu on the s.e., with an area of 4,902 sq. m. A ridge running n. and s., somewhat to the e. of the center, divides the island into the provinces of Negros Occidental and Negros Oriental, and practically precludes intercourse by land between the two sides. The interior is dense forest land inhabited by wild tribes; p. 612,386.

**Nehemiah**, Hebrew leader, the colleague of Ezra in the work of reorganizing the Jewish state after the exile.

**Nehru, Jawaharlal** (1889- ), national leader in India, outranked only by Gandhi, was born in India of a high-caste family; was educated at Harrow and Oxford; then practised law in India. As a Socialist he fought for the liberation and modernization of India and championed anti-imperialism and anti-fascism. He was imprisoned for obstructing British regulations numerous times. Among his books are *For Freedom*, and *Glimpses of World History* (1942), which he wrote while in prison.

**Neill, Charles Patrick** (1865-1942), American economist and labor expert, was born in Rock Island, Ill. He served as United States Commissioner of Labor in 1905-13. In this capacity, with James B. Reynolds, he prepared the report on the meat-packing industry at Chicago, which was made the basis of a special message to Congress from President Roosevelt, in June, 1906. (See MEAT.) From 1907 to 1910 he was a member of the United States Immigration Commission, and in 1922-

3 was member of the United States Coal Commission.

**Neilson, Lilian Adelaide** (1848-80), English actress. Her first success was in the character of *Amy Robsart* in 1870, and she subsequently played Shakespearean parts.

**Neilson, William Allen** (1869- ), American educator, was born in Doune, Scotland. He was educated at the University of Edinburgh and at Harvard University. In 1900-04 he was associate professor of English at Bryn Mawr, instructor at Harvard, 1904-5, professor of English at Columbia (1905-6) and at Harvard (1906-17), and from 1917 to 1939 was president of Smith College. His published works include *Origin and Sources of the Court of Love* (1899); *Essentials of Poetry* (1912); *The Facts about Shakespeare* (1913); *Burns, How to Know Him* (1917); *A History of English Literature* (1920); *Roads to Knowledge* (1932).

**Neisse**, town, Prussia, in the province of Silesia, on the river Neisse. Its oldest church is that of St. James (12th century). It has manufactures of furniture, lace, wire netting, and machinery; p. 32,604.

**Neith**, or **Nit**, one of the most ancient of the Egyptian goddesses, whose worship extended over the western frontier of the Delta and up to the Fayûm.

**Nejd**, or **Nedjed**, a Sultanate of Arabia, embracing practically all of Desert Arabia and now including the kingdom of Hejaz. It was established in January 1926. It is a desert-girt plateau, some 150,000 sq. m. in area, traversed by hills and fertile valleys. It is celebrated for its horses and dromedaries. The capital is Riyadh; p. 4,000,000.

**Nélaton, Auguste** (1807-73), French surgeon, was born in Paris. Himself a most distinguished operator, he invented the probe bearing his name, which is much used in exploring wounds for bullets.

**Nelson**, city, capital of the province of Nelson, New Zealand, is situated at the head of Blind Bay. It is in a rich and fertile farming district and the climate is particularly suitable for fruit growing; p. 12,250.

**Nelson, Donald Marr** (1888- ), U. S. industrialist and public official; b. in Hannibal, Mo.; ed. at Univ. of Missouri; with Sears, Roebuck & Co., rising to vice-presidency, 1912-1939; director of U. S. national defense purchases, 1939-41; director of U. S. war production, 1942-.

**Nelson, Horatio, Viscount** (1758-1805), British admiral, Duke of Bronté in Sicily, was born in Burnham Thorpe, Norfolk. In 1793

he was dispatched to Naples for troops when he first made the acquaintance of Sir William Hamilton and his wife Emma, who later played so large a part in his life. On his way back he successfully engaged four French frigates and urged Hood to besiege Bastia in Corsica, which fell largely through Nelson's own exertions, as did Calvi (August 10, 1794), where he lost the sight of his right eye. He took part in the battle of St. Vincent (1797), and later in the same year lost his right arm in an unsuccessful attack on Santa Cruz de Teneriffe. But in April, 1798, he rejoined St. Vincent before Toulon. Then, as an independent commander, Nelson swept the Mediterranean in search of the French fleet, which he found at last (August 1) at anchor in Aboukir Bay. In the battle that took place Nelson defeated the French. Nelson, severely wounded in the forehead by scrap-iron, was



Lord Nelson.

created Baron Nelson of the Nile and of Burnham Thorpe. In 1799 the French took Naples, and Nelson conveyed the king and court to Palermo, returning to punish the rebels and hang Caracciolo, once an officer in the Neapolitan navy, for his treason. For his victory at Copenhagen Nelson was made viscount. On April 18, 1805, the Toulon fleet passed Gibraltar on its way to the rendezvous at Martinique; but having been driven back by Sir Robert Calder, it finally anchored at Cadiz. When Villeneuve at length put to sea again, Nelson attacked him off Trafalgar (October 21). It was at the beginning of this engagement that Nelson sent the famous signal, 'Eng-

land expects that every man will do his duty.' Although the English fleet was completely victorious, Nelson was mortally wounded, and died in the afternoon of the same day. He was buried in St. Paul's, London (Jan. 9, 1806). Trafalgar Square was begun in 1829, and the column, surmounted by a statue 18 ft. high, was completed in 1849.

**Nelson, Samuel** (1792-1873). American jurist, was born in Hebron, N. Y. In 1845 President Tyler appointed him a justice of the Supreme Court of the United States. A Democrat in politics Nelson was a Strict Constructionist, concurred in the Dred Scott decision. In 1871 he was a member of the Joint High Commission for the settlement of the Alabama claims. He resigned from the bench in 1872.

**Nelson, Thomas** (1780-1861), Scottish publisher, founder of the firm of Thomas Nelson and Sons, was born near Bannockburn. Between 1835 and 1840, his sons, William and Thomas, entered his publishing business which under their able management greatly increased. In 1900 the New Century Library, the pioneer edition of the classics on India paper was added, in 1903 the Sixpenny Classics, and in 1907 the Nelson Library. The House of Nelson was the first British firm to establish a branch in the United States when in 1854 Thomas Nelson, Jr. opened an office in New York City.

**Nelson, Thomas** (1738-89), American public official and signer of the Declaration of Independence, was born in York County, Va. He was governor of Virginia during Cornwallis' invasion (1781), and took part with the State militia in the siege of Yorktown, where it is said he ordered the bombardment of his own house, because it was believed to be Cornwallis' headquarters.

**Nelson River**, river, Canada, forming the lower course of the Saskatchewan, issuing from n.e. corner of Lake Winnipeg, and flowing n. and n.e. for over 500 m. to Hudson Bay at Port Nelson. Steamers can ascend 90 m.

**Nelumbo**, a genus of aquatic plants (Nymphaeaceæ), commonly known as 'lotus.' They send up, from thick, starchy root-stocks, both floating and aerial leaves. The most widely known nelumbo is the white or rosy-flowered Indian lotus (*N. nucifera*). Originally cultivated to a large extent in the Orient, for its edible rootstalks and seeds, as well as for its beauty, it has been brought to America, and naturalized in ponds and lakes.

**Nemathelminthes**, a phylum or series of the animal kingdom, containing a number of

wormlike forms, many of which are parasitical. The series includes the three following classes: Nematoda; Gordiacea, of which the most important member is Gordius; and the Acanthocephala, including a number of small parasites, mostly found in aquatic vertebrates.

**Nematodes, Thread-worms, or Round Worms**, constitute a somewhat isolated class of the animal kingdom. Frequently parasitic, the class as a whole exhibits some peculiar adaptations to a parasitic, or at least a concealed, mode of life. The non-parasitic forms are to be found everywhere in rotting animal or vegetable matter, and can be recognized by their white color, small size, and peculiar wriggling method of locomotion. The species of *Ascaris* are parasites of man and domestic animals; others are parasitic on plants, producing abnormal growths. Some of the more important parasitic forms will be found discussed under ASCARIS, FILARIA, TRICHINA. Of non-parasitic forms examples are the vinegar eels and the related forms, common in organic substances such as paste.

**Nem. con.** (*nemine contradicente*), 'no one contradicting'; unanimously.

**Nemea**, valley in Argolis, in ancient Greece, the scene of Hercules' slaughter of the Nemean lion. In historical times it was famous for its temple and festival of Zeus, which was held every two years, under the presidency alternately of Cleonæ, Corinth, and Argos.

**Nemertea**, a group of unsegmented worms zoologically interesting. The majority are marine animals, a few are fresh-water and a few terrestrial, while a few are parasitic, or more probably commensal, on molluscs. A common example is the purplish-black ribbon-worm, or sea-snake (*Lineus marinus*).

**Nemesis**, in ancient Greek mythology, a goddess, the daughter of Night, or Erebus. She is usually considered a personification of popular indignation against wanton crime. Later writers regard Nemesis as a deity who was jealous of excessive prosperity, and brought human pride low.

**Nemi**, lake, Italy, among the Alban Hills, 20 m. s. of Rome. It fills an extinct crater, 1,060 ft. above sea-level. On its margin was a famous grove to Diana celebrated because its priest held office until he was slain by his successor.

**Nemophila**, a genus of North American herbaceous plants (Hydrophyllaceæ) with blue or white flowers. They are hardy annual plants, easy to cultivate.

**Nennius** (fl. 796), Welsh historian, supposed author of the *Historia Britonum*. Writ-

ten in Latin, it is chiefly valuable as the collection of legends from which the whole Arthurian cycle sprang. It was first printed in 1691 in *Scriptores Quindecim*.

**Neocene**, or **Neogene**, is a term used to distinguish the later Tertiary from the older Tertiary, or Poleogene, in geology.

**Neodymium**, Nd, 143.6, a metallic element (sp. gr. 7, m.p. 840° C.) of the 'rare earths,' forming one of the components of didymium.

**Neolithic**. See **Stone Age**.

**Neon**, Ne, 20, a gaseous element discovered (1898) by Sir William Ramsay, and present in the atmosphere to the extent of one or two parts per 100,000.

**Neophyte**, the name given to those recently admitted to the profession of some religious creed, or initiated into the practice of secret rites. It has been applied to those entering a religious order.

**Neo-Platonism**, a system of Greek philosophy, originated in Alexandria in the 3d century A.D. However far removed Plotinus, the real founder and chief representative of the school, may be from the Platonism of the Athenian philosopher, his system is one which, for loftiness of conception and fulness of elaboration, may rank with the great philosophies of the classical period. The principal aim of Plotinus was to give expression to the conception of that supreme unity which is the source of all existence and all knowledge. The Neo-Platonic school continued during the 4th and 5th centuries—Porphyry, Iamblichus, and the Athenian philosopher Proclus being the most notable names. Neo-Platonism has been the root and source of practically all later schools of philosophical mysticism.

**Neoprene**, a synthetic rubberlike plastic, formed by the polymerization of chloroprene. It resists deterioration by light, chemicals, oxygen, heat better than does rubber.

**Neoptolemus**, in ancient Greek legend, a son of Achilles, brought to Troy by Odysseus to help finish the war.

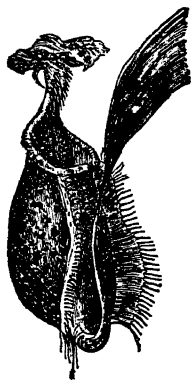
**Neo-Pythagoreanism**, a revival of Pythagoreanism in the 1st century A.D. God was conceived as wholly spiritual, while matter was the source of evil, from the contamination of which men must free themselves by ascetic practices.

**Neozoic**, in geology, includes the Mesozoic (or Secondary) and Cainozoic (or Tertiary) systems.

**Nepal**, independent state, India, on s. slopes of Himalayas. Area, 54,000 sq. m. Nepal is a densely wooded, mountainous country, but

is very fertile, and abounds in wild animals. The Tarai District includes Mounts Everest and Dhaulagiri. Copper, iron, sulphur, and rock crystal are found. Chief exports: silk, cotton, and woolen goods, tobacco, salt, sugar, and indigo. The people, called Gurkhas, are supposed to have originally come from Rajputana, and are of Mongoloid type. Hinduism is their religion; Buddhism that of the aborigines. The climate is arctic, temperate, or tropical according to the altitude. There is a sovereign, but the real power rests with the prime minister. Internal disorder brought Nepal into conflict with the Government of India, and under a treaty, concluded at Segauli (Segowli) in 1815, a British resident resides at the capital, Katmandu; p. 5,600,000.

**Nepenthes**, a genus of shrubby plants from the tropics, whose chief interest lies in the unusual development of its foliage. The leaves are curved or spirally twisted, terminating in a second expansion, like a hollow-flask, surmounted by a lid over the opening, which is really the blade of the leaf.



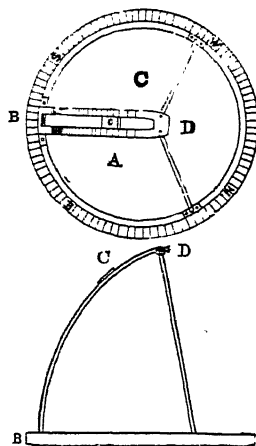
*Nepenthes*, or Pitcher Plant.

**Nepeta**, a genus of hardy herbaceous plants belonging to the order Labiatae. *N. cataria* is the catmint, or catnip. Cats are fond of playing with this plant, evidently enjoying its odor.

**Nepheline**, a silicate of aluminium and sodium, which crystallizes in small white hexagonal prisms (sp. gr. 2.6; h.=6). It is common in lavas, being an essential constituent of phonolite. In plutonic masses with granitic texture, nepheline usually takes the form of elæolite, which has a dull, greasy luster. Nepheline weathers readily, passing into natrolite, analcite, and other zeolites.

**Nephelium**, a genus of tropical evergreen trees belonging to the order Sapindaceae. They bear pinnate leaves and many flowered panicles of small flowers, followed by globose fruits.

**Nephoscope**, an instrument used in observing the motion of clouds. It is made in various forms, the usual one consisting of a mirror, with scales, sighting-rods, etc.



*Nephoscope: Plan and Elevation.*

A, Mirror; C, eye-piece.

**Nephrite**, or Jade, is a calcium, magnesium, ferrous silicate. It is very hard (h.=6.5) and tough, and is usually dark green or pale green in color. Nephrite is found in Turkestan, Siberia, and New Zealand.

**Nephritis**, in medicine, the general term for various forms of inflammatory disease of the kidney. The term 'Bright's disease' includes several forms.

**Nephrolepis**, a genus of tropical ferns with simply pinnate fronds, the pinnæ being articulated at the base. The common house plant, the 'Boston fern,' is a variety of *N. exaltata*, and has many long fronds.

**Nepos**, **Cornelius**, a Roman historian, probably a native of Verona, was a friend and contemporary of Cicero, Atticus, and Catullus. He wrote a collection of lives of famous persons, chiefly Greeks, of no great importance as a historical authority, but the excellent Latin and simplicity of style have made it a favorite school-book.

**Neptune**, the 8th and, until the discovery of Pluto in 1930, the farthest known planet. It was foreshadowed by John Couch Adams

in 1845 and by Leverrier in 1846, and identified by Galle at Berlin, Sept. 23, 1846, as a ninth-magnitude star, with a diameter of 33,000 m. Traveling round the sun at the rate of  $3\frac{1}{2}$  miles a second, Neptune completes a revolution in 165 years. Neptune's solitary satellite, Triton, was discovered by Lassell in October, 1846.

**Neptune** (Lat. *Neptunes*), in Roman mythology the god of the sea. He was identified with the Greek Poseidon. See POSEIDON.

**Nereids**, in ancient Greek mythology, fifty nymphs of the sea, daughters of Nereus. Thetis, the mother of Achilles, was the most famous.

**Nereis**, a genus of chaetopod worms, of which common American species are *N. virens*, the clam-worm, *N. pelagica*, and *N. limbata*.

**Nereus**, in Greek mythology, the son of Pontus and Gæa, and father of the Nereids. He is the wise old man of the sea and bears the trident as the sign of his authority.

**Nergal**, Assyrian god of hunting and of warfare. The planet Mars was connected with this god, according to Assyrian belief.

**Neri, Filippo de'** (1515-95), Italian philanthropist, at Rome engaged in the relief of the poor, the instruction of children, and the reclamation of the fallen, founding an asylum for poor and sick strangers. He was the originator of the oratorios, or sacred musical entertainments, and founded (1558) a monastic order, the Fathers of the Oratory. Neri was canonized (1622) by Gregory xv. His *Ricordi*, or advice to youth, is well known. See *Lives*, by Capeceatratro (Eng. trans. 1882).

**Nerium**, a genus of Asiatic and E. European shrubs belonging to the order Apocynaceæ. The most frequently cultivated species is the tender *N. oleander*, the common oleander.

**Nernst, Walther** (1864-1941), German chemist, was born at Briesen in W. Prussia. His principal work was on the origin of the electric current and the theory of chemical equilibrium. He invented the Nernst electric lamp. See ELECTRIC LIGHTING.

**Nero**, a family of the Claudian clan at ancient Rome. The original name of Nero, last of the Cæsars, was Lucius Domitius Ahenobarbus, but after his mother's marriage with the Emperor Claudius, he was adopted by the latter (in 50 A.D.), and took the name of Nero Claudius Cæsar Drusus Germanicus. On Claudius's death, in 54, Agrippina managed to secure the proclamation of Nero as

emperor, to the exclusion of Claudius's own son, Britannicus. His crimes began from his attempts to free himself from his mother's control. He had Britannicus poisoned in 55 A.D. In 59 Agrippina herself was murdered; in 62 his wife Octavia was first divorced, then put to death. This enabled Nero to marry Poppæa Sabina, whom he had long had as his mistress; her, too, he killed in 65, in a fit of passion. The chief events of his reign were the burning of Rome in 65 A.D., which has been said to have been the result of his orders, but this depends on no evidence. The blame was thrown by him on the Christians, many of whom were put to death. The prætorian troops at Rome proclaimed Galba, governor of one of the divisions of Spain, emperor in 68. Nero, deserted, fled from Rome, and next day killed himself.

**Nerva, Marcus Cocceius** (32-98 A.D.), emperor of Rome from 96 to 98 A.D. His just administration restored tranquillity to the Roman world.

**Nervii**, ancient Gallic tribe, belonging to the Belgic Gauls. Their territory extended from the River Sabis (the Sambre) to the sea, in modern Hainault. They were subdued by Julius Cæsar in 57 B.C.

**Nervous System.** A primitive nervous mechanism might be represented by two cells connected with each other by a delicate filament of irritable protoplasmic material. In a highly organized creature like man the nervous system includes the brain, the spinal cord, the nerves, and the end organs, as well as the various ganglia of the cerebro-spinal and the sympathetic systems. Each nerve is constituted of a collection of nerve bundles surrounded by a sheath of connective tissue, the perineurium; and the various bundles are bound together by bands of similar tissue, the epineurium. Closely connected with, but to some extent distinct from, the cranial and spinal nerves is the subsidiary sympathetic system, whose special province is the nervous supply of the blood-vessels and the involuntary muscles. The leading characteristic of a nerve cell is its irritability; that of a nerve fiber is its faculty of transmitting waves of nerve energy at the rate of about a hundred feet per second. The transmitted impressions are correlated by the nerve centers, and from other centers in the cortex of the cerebral hemispheres impulses are dispatched along the motor nerves, and produce contraction of the muscles. In the spinal cord are groups of cells called ganglionic centers

which make with the sensory and with the motor fibers a secondary nervous arc between the sensory organs and the muscles. It is by means of these short nervous arcs that reflex action is possible. While they often demand most delicate co-ordination of various groups of muscles, reflex acts do not require intelligence or even consciousness.

Every time nerves transmit a message they undergo partial destruction, and even when at rest they require nutriment. They are therefore supplied with blood-vessels, which ramify round them in microscopic networks, and with *nervi nervorum*, the nerves of the nerves. The brain and spinal cord are described in separate articles. According to the simplest classification, twelve pairs of cranial nerves spring from the brain. The first pair are the olfactory, and their filaments are distributed to the mucous membrane of the nostrils. The second pair are the optic or sight nerves. The third, fourth, and sixth pairs are distributed to the muscles of the eye, and, being motor, they control the movements of the eyeballs. Each of the fifth pair of nerves is very large, and has three great branches. They are partly sensory and partly motor, and are distributed to the skin and muscles of the face as well as to part of the tongue. The seventh pair comprise the facial nerves. The eighth are the auditory or ear nerves. The ninth are partly concerned with taste and partly motor. The tenth pair are known as pneumogastric or vagi (wanderers), and they are distributed to the thoracic and abdominal organs. The eleventh pair contain motor filaments for the muscles and the neck, while the twelfth supply the muscles of the tongue. Of the spinal nerves thirty-one spring from each side of the cord. They are classified into eight cervical pairs, twelve dorsal, five lumbar, five sacral, and one coccygeal pair. Each spinal nerve has an anterior or motor root, and a larger posterior and sensory root, with a ganglion upon it. The two roots coalesce, and many of the spinal nerves unite at some distance from the cord to form a network or plexus.

The sympathetic system of nerves forms a double chain of ganglia, one on each side, or slightly in front, of the spinal column. These ganglia communicate with each other and with the spinal nerves by delicate commissural threads. Nerves, like other tissues, may be cut, torn, bruised, and sometimes considerable portions of them are removed at surgical operations. Again, a nerve may be affected by a bony fracture or by the

pressure of a tumor of a neighboring tissue. Damage to a purely motor nerve produces loss of muscular power as well as muscular wasting. An injury to a sensory nerve may be followed by diminution or loss of sensation. Again a paræsthesia, such as numbness, burning, cold, or tingling, may result, or an alteration in a special sense. After simple section, nerves readily unite should the cut ends be kept in apposition, and generally massage of the muscles and faradization suffice to maintain tone and nutrition till the injury is repaired. Tumors of nerves are known as neuromata. While anæmia and cachectic conditions tend to produce degeneration of the nerve fibers, the most grave degenerative changes are those which follow the severance of a fiber from its trophic center. See separate articles for neuralgia and neuritis.

**Ness, Loch**, one of a chain of lochs in the Great Glen, Inverness-shire, Scotland. It extends 22½ m. in a s. s.w. direction, and has an average breadth of 1 m. The s. end communicates by the Oich R. and part of the Caledonian Canal with Loch Oich; the n. end by another part of the canal and the Ness R. with the Moray Firth.

**Nesselrode, Karl Robert, Count** (1780-1862), Russian statesman, of German descent, born at Lisbon; took a prominent part in the negotiations preceding the peace of Paris (1814) and in the congress of Vienna. In 1816 he became minister of foreign affairs, and for forty years he did much to influence the fortunes of Europe.

**Nessler's Reagent**, a solution of mercuric iodide in potassium iodide solution in the presence of excess of caustic potash. It is a most delicate test for ammonia.

**Nestor**, in early Greek legend, one of the twelve sons of Neleus, king of Pylos, and the only one left alive by Hercules when he captured Pylos. In the *Iliad* and *Odyssey* he appears as the typical old man, in his wisdom, his garrulity, and his admiration of the past.

**Nestorians**, a heretical party in the 5th century, who drew so wide a distinction between the two natures of Jesus Christ as to imply a twofold personality. Nestorius, who gave the sect its name, was made patriarch of Constantinople in 428. Nestorius was banished (435) and other irreconcilables took refuge in Persia, India, China, but they did not succeed as missionaries. The so-called 'Nestorians' of Turkish and Persian Kurdistan and neighboring territory deny all con-

nection with the heresiarch and call themselves Kaldani, claiming descent from the ancient Chaldeans. They have been the object of much missionary activity on the part of the Roman Catholic Church and Protestants, especially Americans. They are sometimes called Christians of St. Thomas.

**Nests.** The habit of nest-building is best developed in birds. Yet many birds do not make nests; some, like many sea birds, lay their eggs on the bare ground, and others merely collect together a rough heap of material so as to shelter slightly the sitting hen. Again, the harvest-mouse and the squirrel

with each other, irrespective of the size or shape of the meshes or holes. Nets of various forms are employed extensively in the fishing industry. Butterflies and birds are captured with nets. Other examples are hair nets, tennis nets (see *LAWN TENNIS*), veillings, and laces of many varieties (see *LACE*), and nets in aeronautics (balloons).

**Netherlands, The**, more generally known as Holland, a country in the northwestern part of Europe, lying between the North Sea on the w. and n. and Germany on the e., with Belgium on the s. Its greatest length from n.e. to s.w. is 190 m. and its greatest width



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*Main Business Street in Amsterdam.*

among mammals, the sticklebacks among fishes, ants, bees, and wasps among insects, all build nests. The weavers, tailor-birds, and humming-birds all construct nests of special beauty and complexity. In birds the object of the nest is merely to serve as a convenient place for incubation; but among other animals the nest frequently serves, in addition, as a habitation. The squirrel constructs two nests—a summer one, in which the young are reared, and a winter one, where hibernation is carried on. See E. Ingersoll's *Nests and Eggs of North American Birds* and C. A. Reed's *North American Bird's Eggs*.

**Net**, any fabric composed of animal, vegetable, or (as in the case of asbestos) mineral fiber, wherein the threads are so twisted or plaited, looped or knotted together, as to intersect one another at regular intervals. Thus, net means any openwork fabric in which the knots or intersections alternate

from e. to w. 125 m. Area: 15,771 sq. m., of which 3,192 sq. m. are gulfs and bays and interior waters. The country is exceedingly low and flat, a large part of it below the sea level. Stretches of sandy dunes thrown up by the action of wind and water and artificially constructed dikes of earth faced with stone protect the low coast lands from the encroachments of the sea. Inside this line of dunes and dikes are the 'polders,' fertile areas of land which have been protected by dikes, drained dry, and made available for industrial and agricultural purposes; back of the polders the country rises gradually.

The country is watered by the Rhine and its tributaries, the Maas and the Scheldt, all of which are commercially important, and there are many lakes and canals. The climate is variable, with considerable moisture, and is subject to fairly great extremes. The low maritime districts are apt to be malarial.



and marsh fever is rather prevalent. The annual rainfall is about 28 inches. The soil of the reclaimed lands, or polders, is exceedingly fertile, but nearly a fifth of the entire area is unproductive. Pasture lands constitute a third of the area.

The fisheries of the Netherlands are of considerable importance, more than 5,000 vessels being engaged annually in fishing. Oysters and herrings are the most important fish products and are exported in considerable quantities. Other valuable fish are mussels, shrimps, and smelts.

The Netherlands is pre-eminently an agricultural country, dairying and stock raising being the chief occupations. The most important grains, named according to quantity produced, are: oats, rye, wheat, and barley. Sugar beets, flax, and potatoes are grown in abundance. Excellent breeds of cattle are raised and great amounts of butter, cheese, and milk are produced. Poultry yards supply large quantities of eggs for export; bee-keeping is a thriving industry. The raising of bulbs, flowers, and fruit is profitable.

Lack of iron and coal has hindered manufacturing. There are distilleries, sugar refineries, salt works, breweries, and tobacco factories. Air planes and radios of superior excellence are manufactured as well as earthenware (bricks, potteries, tiles, china) in which the country holds a high rank. The diamond industry of Amsterdam is world-renowned and the gold and silversmith business at Schoonhaven is important.

Regular steamship lines connect the Netherlands with all parts of the world. Amsterdam is joined to the sea by canal. Rivers and canals totalling 4,660 m. carry much of the domestic commerce. Holland rates high in the total of passengers and goods carried by airplane, Amsterdam and Rotterdam being well-served by airlines.

Re-exports bulk large in the country's export figures, Rotterdam being Europe's leading transit harbor. Holland's overseas territories furnish a large part of the imports. Rotterdam is the world's chief iron ore market and Amsterdam is famous as a tobacco, coffee, timber, and cocoa butter market. Exports include also agricultural and dairy products, gold and silver, textiles, coal, manures, paper, and other products of the manufacturing industries ranging from harbor works, ships and bridges to artificial silk and diamonds.

The standard coin is the 10-florin gold piece and the unit of silver coinage is the

guilder or florin of 100 cents. The principal coins are the florin, the rijksdaalder (2½ guildens); in silver: pieces of 10, 25, 50, 100, and 250 cents; in bronze, ½ cent, 1 cent and 2½ cents; and in nickel, 5 cents. The funded debt in 1933 was 522,091,000 florins and the gold stocks were abnormally high.

The royal family and the majority of the people belong to the Reformed Church. In general the population is divided per 20,000 inhabitants: 12,560 Protestants, 7,122 Roman Catholics and 218 Jews. Education is free and compulsory between the ages of 7 and 13. Holland heads the list of state expenditure for education in Europe (22 per cent. of the budget).

Service in the army is partly voluntary and partly compulsory, chiefly the latter, between the ages of 19 and 40. The maximum strength of the annual contingent is fixed at 19,500 (1,000 for sea service). The navy is maintained to protect the Dutch coast and the overseas possessions. Helder is the principal naval base in the Netherlands and Batavia in the East Indies.

The population of the Netherlands is 8,729,000. The chief cities and their population are Amsterdam, 794,000, Rotterdam, 612,000, The Hague (the capital), 495,000, and Utrecht, 156,194.

The Netherlands is a constitutional hereditary monarchy, divided into 11 provinces, each with its own representative body—the Provincial States. The national executive power belongs to the sovereign, and the legislative authority rests with the sovereign and the States-General. There is universal suffrage and proportional representation. The low lands about the mouths of the Scheldt, Maas, and Rhine were inhabited in the 1st century A.D. by the Frisii, Batavi and Belgæ who all came under Roman dominion. On the division of Charles the Great's dominions (843), the Netherlands became part of Lotharingia, the borderland between Germany and Gaul, which from 879 onward was associated with the German kingdom. When Charles the Bold died (1447) the territory passed to his son-in-law, Maximilian of Austria, and became part of the 'Circle of Burgundy.' Philip the Fair, son of Maximilian, linked the Netherlands with Spain by marriage; and Philip's son, Charles V., the future emperor, was born at Ghent. As his subjects, the Dutch could trade throughout his vast dominions, and thus began their worldwide commerce. For the southern provinces, his reign was a golden age. On his abdica-

tion (1555) the Netherlands passed to his son, Philip II. of Spain, afterwards husband of Queen Mary of England. Philip left his half-sister Margaret, Duchess of Parma, as regent of the Netherlands. Her choice of a foreign ecclesiastic as her adviser, the continued presence of the Spanish garrisons, and persecutions of Protestants estranged alike the people and the nobles. The latter, after vainly petitioning the duchess for a suspension of the king's edicts against Protestantism, founded the party of the 'Gueux,' or Beggars (1566), pledged to stand with the people against Spanish tyranny and the Inquisition. Prominent among the petitioners were Prince William of Orange and Counts Egmont and Hoorn. A violent anti-Catholic movement arose.

Philip's reply to this outbreak was to despatch the Duke of Alva, renowned for his cruelties, with 10,000 Spanish troops, to the Netherlands. Alva carried on a relentless campaign for the suppression of Protestantism. Thousands were put to death—among them Counts Egmont and Hoorn—and other thousands fled the country. In 1568 William, Prince of Orange and Count of Nassau, gathered together a small army to oppose the Spanish oppressors. At first the little Dutch army met with slight success, but with characteristic persistence they refused to recognize defeat. On July 18, 1572, by the league of Dordrecht, William of Orange (William the Silent) was recognized as governor, in lieu of the Duke of Alva, over the provinces of Holland, Zeeland, and Utrecht, and leader of the defensive league.

In 1576 the Estates of Holland and Zeeland were summoned to meet at Delft with a view to closer union; an Act of Federation, the germ of the Dutch Republic, was drawn up. The seven northern provinces entered into a union—the Union of Utrecht—which in 1581 declared its independence. William of Orange became the ruler of Holland and Zeeland. William was assassinated, at the instance of the Spanish king, in 1584, and in 1585 Antwerp surrendered to the Duke of Parma. At this point long hoped for aid came from England. Dutch victories led in 1609 to the conclusion of a truce.

Many refugees now came in from the hitherto more cultured southern provinces, and the next eighty years were the most brilliant in Dutch intellectual life. The East India Company was founded by Oldenbarneveldt in 1602. Trade with the Indians at

what is now New York was opened in 1610, and a settlement was made there in 1624. Navigators like Willem Barents, Linschoten, and Le Maire explored alike the Arctic seas and the far South. The history of the years 1609-1747 is largely concerned with the conflict of the monarchical and republican elements in the constitution.

The war with Spain, renewed in 1621, was brought to an end in 1648, by the Peace of Westphalia, by which Spain recognized the independence of the United Provinces and their conquests in the Far East. Commercial rivalry with England led to two great naval wars, one in 1652-4 and a second in 1664-7. The Peace of Breda, concluded July 31, 1667, gave Holland Surinam but New Netherland was ceded to England. In 1668 Holland joined England and Sweden in a Triple Alliance to check the growing power of France. The Dutch were parties to the Grand Alliance (1679), and joined in the wars of William III. and the Spanish Succession, but gained little by either. The growth of navigation lost them their trade, and the cessation of religious warfare brought in greater nations as competitors. Hence they declined throughout the 18th century. The Belgian provinces passed, at the peace of Rastatt (1714), to the house of Austria.

In the American Revolution the Provinces joined the armed neutrality; Great Britain attacked them, and their disasters caused the deposition of William V. by the 'patriot party' (1768). An invasion by the French republican armies resulted in the establishment of the Batavian republic (1795). Its repeated failures to respond to Napoleon's demands for money and men caused him to unite the country with France. The Belgians revolted in 1830 and in 1831 the Treaty of London guaranteed the neutrality of the new kingdom (see BELGIUM).

King William V. abdicated in 1840 and was succeeded by William II., his son, who granted a new and more parliamentary constitution in 1848. He was succeeded by his eldest son, William III., in 1849. Since the accession of William III., the country has been occupied chiefly with colonial and internal affairs, and has taken little part in European politics. William III. died in 1890 and was succeeded by his daughter Wilhelmina, with her mother, Princess Emma, as regent. Wilhelmina assumed the throne in 1890, and in 1901 was married to Prince Henry of Mecklenburg-Schwerin who died, 1934. The birth on April

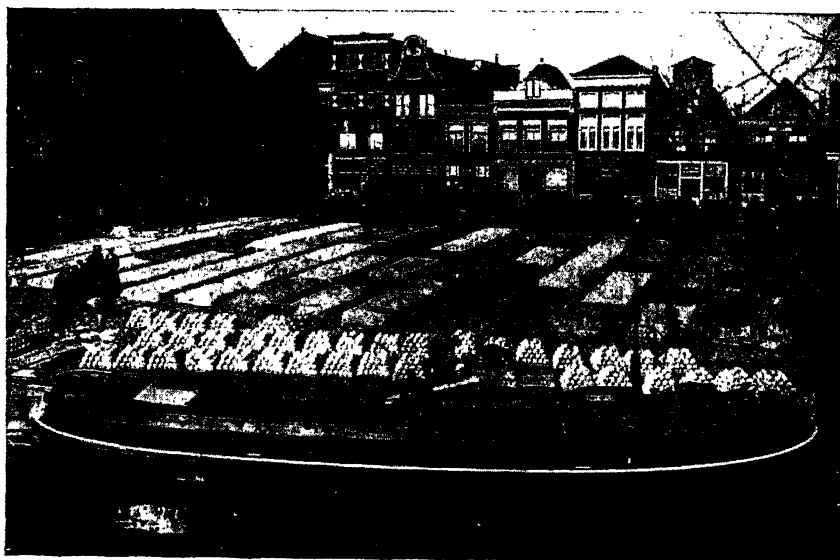
30, 1909, of a long-desired heir to the throne (the Princess Juliana) was hailed with delight.

During World War I the Netherlands maintained strict neutrality.

With the outbreak of the European War, 1939, Germany massed large numbers of troops along the Netherlands and Belgium borders giving rise to the belief that the Germans might attempt to strike at the Allies through those countries. Airports on the Netherlands coast would bring German

rises from three Low German dialects. The new Netherlands or modern Dutch dates from the 16th century. Unification was promoted by the severance from Spain and the Spanish Netherlands towards the end of the 16th century, by the first Dutch grammar (1585), the poems of Vondel (1587-1679), the authorized Dutch version of the Bible (1626-37), the growth of the drama, and the literary society, 'Nil volentibus arduum,' which tended to regularize spelling and phraseology.

The earliest beginnings of Dutch literature



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*Cheese Market at Alkmaar, Netherlands.*

bombers much nearer to London and other strategic English objectives. Accordingly the Netherlands completely mobilized her army and prepared to open dykes which would put much of her territory under water in the event of invasion.

The Nazis invaded the Netherlands on May 10, 1940 and in four days forced the capitulation of the entire Dutch army, Queen Wilhelmina rushing to safety in England. Here the government-in-exile was established, under Premier Gerbrandy. Rotterdam was severely bombed by the Nazis. By early 1945 the Nazis had been driven out and the Queen returned. In the same year the Dutch East Indies were freed of Japanese misrule.

**Netherlands: Language and Literature.** Dutch (now Nederlandsch officially)

(including Flemish) consist mainly of translations from Romance sources by Jakob van Maerlant (13th century) and others. In the 14th century Jan Boendale wrote rhymed chronicles and didactic poems, and wandering minstrels produced notable lyrics.

Renaissance influences were largely spread by the 'Eglantine' Kamer der Rederijker in Amsterdam. This society developed the native drama. Jakob Cats (1577-1660), by his 'mixture of canny morality and shrewd, homely wit,' found a place in every Dutch household, and founded the school of Dordrecht. Descriptive poems, especially of Dutch river scenes, are conspicuous in Dutch literature. Andries Pels, in 1695, founded the literary society, 'Nil volentibus arduum,' and based drama on strict rules, chiefly French.

Simple prose was written by Justus van Effen (*Hollandsche Spektator*, 1731-5). There was much translation of French, Italian, and Spanish romances. A reaction against classicism followed. Bilderdijck (1756-1832), lyric, epic, and dramatic poet, is the next great name in Dutch literature. Following Bilderdijck a new period begins. Jakob van Lennep (1802-68), poet, dramatist, and romancer, was the Dutch Walter Scott. Among a host of other writers of the middle third of the 19th century are Bogaers (1795-1870) and De Genestet (1830-61), poets; Nicolaas Beets (1814-1903), poet, novelist, and theologian. *De Gids*, a journal founded in 1837 by Potgieter and others, did much to stimulate and purify Dutch literature.

After the eighties vigorous writers such as Willem Kloos, Albert Verwey, Lodewijk van Deyssel, and Herman Gorter influenced Dutch literature in a radical direction. The movement later abated but it left an influence toward radicalism in its wake. Famous names of the 20th century are: Margo and Carel Scharten-Antink, Dr. Baeke, Ina Bakker, Henry Borel, Johanna Breevoort, C. J. A. van Bruggen, Carry van Bruggen, Frans Coenen, Louis Couperus, Lodewijk van Deysel, Frederik van Eeden, Marcellus Emants, Frans Erens, Herman Heyermans, A. M. de Jong, Jo van Ammers-Küller, J. L. F. de Liefde, Jac. van Looy, Johan de Meester, Top Naeff, Is. Querido, Q. A. de Ridder, Herman Robbers, G. Schrijver, Alie Smeding; among poets: Bastiaanse, Boutens, Herman Gorter, Geerten Gossaert, Henriette Roland Holst, A. Roland Holst, Nellie van Kol, Leopold, Villem de Merode, Frans Mijnsen, Nijhoff, Adama van Scheltena, Hélène Swarth; among dramatists: Fred van Eeden, Marc. Emants, Frans Mijnsen, Mrs. Mees.

**Nethersole, Olga** (1870- ), English actress, was born in London, and was manager of several London theatres. Her chief characters are Sapho in the dramatic version of Daudet's novel, Janet Preece in *The Profligate*, and the heroine of *La Tosca*. She made her first appearance in the United States in 1894, and has made frequent visits since then, presenting all her well-known characters. In 1907 she made her *début* in Paris under her own management at the Théâtre Sarah Bernhardt, and played the leading rôles in *The Second Mrs. Tanqueray*, *La Dame aux Camélias*, *Adrienne Lecouvreur*, *Magda*, etc.

**Nettle**, a genus (*Urtica*) of herbaceous plants belonging to the order Urticaceae. The two common species are the great nettle (*U.*

*dioica*), with heart-shaped leaves tapering to a point, and long, branched clusters of small greenish flowers; and the slender nettle (*U. gracilis*), with lanceolate leaves. A burning juice is emitted by both when the leaves or stems are touched.



Nettle (*Urtica dioica*).  
1, Male flower; 2, female flower.

**Nettleton, Walter** (1861-1936), American painter, began his art studies at Yale. He continued these at the Art Students' League in New York, and in Paris, gaining a reputation for his Breton landscapes. Later he devoted himself particularly to painting New England snow scenes. He exhibited at the Paris Salon and the chief American exhibitions.

**Nettle-tree**, a deciduous tree of the genus *Celtis*, of the order Ulmaceae. One American species (*C. occidentalis*) is known as sugarberry; others as hackberry. Their fruit was very useful to the Indians.

**Neuchâtel**, Swiss canton, bordering on France. Its chief industry is watchmaking. Cattle are reared and cheese is made. It was ruled from 1707 by the King of Prussia, whose rights were given up in 1857. Area, 312 sq. miles; p. 124,700.

**Neuchâtel**, capital of above canton, on the northwest shores of Lake Neuchâtel; much frequented for its excellent educational establishments. There is an academy with faculties similar to those of the chief Swiss universities; p. 22,775. It manufactures watches, jewelry, electrical appliances, and condensed milk.

**Neuchâtel, Lake**, in Neuchâtel canton, with an area of 92 sq. miles and a depth of 505 ft. It is the largest lake entirely within Swiss territory.

**Neudek**, town, Austria, in what was formerly Bohemia; 10 m. n.w. of Karsbad; p. 8,996.

**Neuilly-sur-Seine**, town, department Seine, France, on the River Seine, just n. of the Bois de Boulogne. It is substantially a Parisian suburb. Here stood, till it was burnt down in the Revolution of 1848, the beautiful Château de Neuilly, built by Louis xv., and the favorite residence of Louis Philippe; p. 52,500.

**Neumünster**, town, Prussian province of Schleswig-Holstein. Its real importance is due to its cloth factories, though its situation makes it a center for trade between Kiel and Hamburg; p. 40,000.

**Neunkirchen**, town, Rhenish Prussia. Over 320,000 tons of pig iron and 2,500,000 tons of coal are produced annually. The town dates from the thirteenth century; p. 34,532.

**Neu-Pommern, New Pomerania, New Britain**, largest island in Bismarck Archipelago, West Pacific, lies 50 miles northeast of New Guinea, and is separated from it by Dampier Strait. It became part of a German protectorate in 1884, and in 1885 its name was changed to Neu-Pommern. Area, 9,600 sq. miles.

**Neuquen**, territory, Argentina, with Chile to the w. It is traversed by spurs of the Andes. Cattle, horses, and sheep are reared. Area, 42,345 sq. miles; p. 28,000, mostly Indians.

**Neuralgia**, a painful affection of the nerves, the pain may be referred to a specific area, or to an organ at a distance from the seat of irritation, in which case the neuralgia is often called reflex. Superficial neuralgia is generally unilateral, and it is the fifth or trifacial nerve that is most often involved. Intercostal neuralgia is frequent. Associated with nearly all neuralgias may be derangements of tactile sensation, such as hyperæsthesia or anæsthesia of part of the adjacent skin.

**Neurasthenia**, in medicine, a disease of the nervous system, often spoken of as 'nervous exhaustion,' depending apparently upon overdrafts on the supply of nerve energy. Neurasthenia may result from overwork or overplay, though it is far more likely to occur through worry than through work. It may also show itself after a severe shock to the nervous system, and may be a considerable time in developing.

**Neuritis**, or inflammation of a nerve, may arise from rheumatism, exposure of the nerve in an open sore, and traumatism. Considerable hyperæmia, swelling, and proliferation of cells result from neuritis; and in inflammation of intercostal or other spinal nerves a skin eruption may appear on the area supplied by the nerve.

**Neurology**. See **Nervous System**.

**Neuron**, the cerebro-spinal system, consisting of the brain and the spinal cord connected by the medulla oblongata.

**Neuron**, or **Neurone**, the unit of the nervous system, consisting of the nerve fibre and all the fibrils. It has been estimated that there are 3,000,000,000 neurons in an adult human being.

**Neuse River**, North Carolina, is formed by the junction of the Flat and Crabtree Rivers in Wake co., near Raleigh.

**Neuss**, town, Rhenish Prussia. Its beautiful Roman Catholic minster dates back to 1209. The Gothic Rathaus has a fine collection of paintings by Janssen. It has iron foundries, flour mills, tanneries, and breweries; p. 49,000.

**Neutrality**, the condition of a nation which takes no part in a war. It entails reciprocal rights and duties on the neutral states and on the belligerents. Neutrality may be temporary, conditioned by the existence of war, or permanent. The first step is a voluntary exercise of sovereign power by the state, terminable at will, and independent of external authority. The second type is a necessity imposed upon the state from without by international agreement, and is to that extent a limitation of the sovereign power. As compensation, the state thus neutralized is granted immunity from attack or invasion, guaranteed by a sufficient number of powers to render such guarantee effective. Switzerland (1815), Belgium (1831), Luxembourg (1867), Savoy, the Ionian Islands, and the basin of the Congo have been thus neutralized. The duties of belligerent states toward neutral states consist chiefly in the avoidance of neutral land or water in the conduct of, or preparation for, hostilities. Toward belligerents, a neutral state has the passive obligation of abstention from acts of assistance to either side, and the active obligation of preventing the use of its territory by either belligerent for military or naval purposes. For example, the ships of war of either belligerent, according to The Hague Convention of 1907, are allowed to enter neutral ports and stay for a time not exceeding 24 hours, ex-

cept in such states as have special enactments permitting a longer stay; to obtain necessary provisions and repairs, and only enough coal to take them to their own nearest port.

It is the general opinion that international law imposes no obligation upon a neutral government to prevent its citizens, as individuals, from providing nations at war with ships, money, arms, or other assistance. It does, however, give to belligerent warships the right of visit and search of suspected merchant vessels, the seizure of contraband of war, and, under certain conditions, seizure of the vessels themselves, subject to the judgment of prize courts of the captor nation. The expansion of international trade and the development of military and naval resources have brought with them further questions which remained unsolved at the outbreak of the European war of 1939. See INTERNATIONAL LAW.

**Neutron**, a chemical element, discovered by J. Chadwick in 1931, differs from other elements by having no nuclear charge, and hence no satellite electrons.

**Neuve Chapelle**, village, France, department of Nord. During the Great War of Europe it was the site of the first important offensive by the British on the Western front. The attack was begun on the morning of March 10, 1915, for the purpose of driving the Germans back toward Lille. After valourous fighting the village was taken, but because of the heavy casualties sustained, offensive operations were suspended on March 12.

**Neville, Alphonse Marie de** (1836-85), French military painter. He achieved considerable success with his earlier pictures, which dealt with incidents in the Crimean War, the Italian campaign in 1859, and other wars in which French arms took part. His service as an officer in the Franco-German War added new vigor to his work, which raised him to a high rank among contemporary painters.

**Neuwied**, town, Rhenish Prussia, on the Rhine. Here are famous Moravian schools, dating from the 17th century; p. 20,322.

**Neva**, river, n.w. Russia, on which stands Petrograd. It flows from Lake Ladoga into the Gulf of Finland (Baltic Sea), and has a total course of 40 m.; while the area of its basin is over 115,000 sq.m. On an average it is ice-free 218 days, during which its lower course is navigable by large vessels. The frozen period extends usually from the last week in November to the end of April.

**Nevada** (from a Spanish word, meaning

'snow clad'; popularly known as the 'Sage Brush' and the 'Sage Hen' State), one of the Western States of the United States, lies between the meridians of 114° and 120° w. long., and the parallels of 35° and 42° n. lat. It is bounded on the n. by Oregon and Idaho; on the e. by Utah and Arizona; and on the s. and w. by California. The Colorado River forms the s.e. corner. The total area is 110,690 sq.m., of which 869 are water surface. Almost the entire area of Nevada lies within the vast table of land known as the Great American Basin. The surface of the basin is crossed by a series of parallel ridges, some of which have an elevation of 9,000 ft. above the general level of the plateau. Wheeler Peak, the highest mountain in the State, is 13,058 ft. above sea level. These parallel ridges are separated by canyons, valleys, and plains, many of which are deserts. In summer large areas are covered with plains of hard, sun-baked mud, resulting from the evaporation of shallow lakes. The average elevation of the State is 5,500 ft., only four States—Utah, Colorado, Wyoming, and New Mexico—having a greater average height.

The hydrography is peculiar in that the State is almost wholly a region of interior drainage. Most of the streams rising within its borders are either absorbed by the sands of the desert or terminate in saline or alkaline lakes. The Humboldt, the most important river of the State, rising in the n.e. and flowing w. and s., discharges into Humboldt Lake, which at certain seasons of the year overflows its banks and finds an outlet in North Carson Lake. The Colorado River forms the southeastern boundary for a distance of 150 m.

The climate is unusually dry. The highest temperature recorded is 119°; the lowest, -42°. The precipitation varies with the altitude, being greatest on the mountains. In the extreme southwest it is only 3 inches; in the east, 12 inches. The arable lands are mostly confined to strips along the water courses. Other sections are made available by irrigation. Nevada is famous for its mineral wealth, and production is on the increase. Nevada ranks high among the States in the value of gold and silver produced, in smelters' production of copper, and also in lead, and zinc. The leading mineral industry of the State is the mining of copper. For many years the mining of gold and silver was the leading mineral industry of the State. The famous Comstock lode, which was discovered in 1859, yielded a value in gold

and silver of \$340,000,000 in the first 30 years of its existence. Noteworthy discoveries of quicksilver have been reported in various parts of the State. Other mineral products of Nevada are sulphur, in large quantities, gypsum, borates, silica, fluorspar, fuller's earth, diatomite, magnesite, graphite and limestone. The timber of Nevada is unimportant. Three national forest reserves, covering 4,380,385 acres, and parts of five others (590,015 acres) lie within the State.

Agriculture is dependent on irrigation; but, when reclaimed, the soil is well adapted for forage crops, cereals, vegetables and deciduous fruits. Irrigation promises to develop to large importance when the Federal Government's projects are completed. Hay and forage is the main crop, showing a large acreage of alfalfa of which two crops and, in certain valleys, three crops are annually harvested. The 1930 Census showed the value of domestic animals, chickens and bees to be \$28,859,707. The total railway mileage is approximately 2,100. The important lines are the Southern Pacific, the Western Pacific, and the Los Angeles and Salt Lake, which cross from e. to w. and send spurs both n. and s. According to the 1940 Census, the population of Nevada was 110,247. Of this total foreign-born white numbered 12,275; Indians, 4,871; Japanese, 608; Chinese, 483; Negroes, 516; Mexicans, 3,090. The urban population in cities of 2,500 and over represents 39.3 per cent. of the total. The population of the principal cities in 1940 was: Reno, 21,317; Las Vegas, 8,422; Sparks, 5,318; Elko, 4,094; Ely, 4,140.

Nevada has a State Board of Education, consisting of the governor, superintendent of public instruction and, since 1931, one member from each of the five supervisory districts. Attendance in school is compulsory for children from 7 to 18 years of age. The present constitution of Nevada is that of 1864 as since amended. The usual suffrage qualifications are exacted. The chief executive officers are the Governor, Lieutenant-Governor, Secretary of State, Treasurer, Comptroller, Surveyor-General, Superintendent of Public Instruction, Attorney-General, and Inspector of Mines—all elected for a term of four years. The legislature consists of a Senate elected for four years, and a House elected for two years. Under the Reappointment Act, Nevada has 1 Representative in the National Congress. Carson City is the State capital. The earliest European visitors to the present State of Nevada were some

Franciscan friars who crossed the territory on 'heir way to California in 1738. Other visitors were Peter Ogden, of the Hudson Bay Company, who discovered the Humboldt River in 1825; Jedediah Smith, who crossed the region in 1826; and John C. Fremont, who led an exploring party through it in 1843-44. In 1849 the first settlements—incidental to the overland rush to California—were made by the Mormons in the valley of the Carson River. One year previously (in 1848) the territory had become part of the United States by the Treaty of Guadalupe Hidalgo, which closed the Mexican War; and in 1850 the region between parallels 37° and 45° lat., and extending westward from the Rocky Mountains to California, was organized as Utah Territory. The western part of the Territory was not in sympathy with the distant government at Salt Lake City, however; and a separate government was soon established. After the refusal of its request for annexation to California, a petition was presented to Congress; and in 1861 the Territory of Nevada was organized. On Oct. 31, 1864, Nevada was admitted to statehood.

Previous to the discovery of silver in the Comstock Lode, in 1859, the population numbered about 1,000, consisting mainly of Mormons and California gold seekers who had stopped on the way west. Following this discovery there was a great influx of miners of all nationalities. The Comstock Lode was for a number of years the richest silver-mining center in the world. With the decline of the output of the Comstock mines, and the demonetization of silver in the last quarter of the 19th century, the State also fell into decline, and lost one-third of its population. With the opening years of the 20th century, however, a revival set in. Splendid gold mines uncovered s.e. of the Comstock region, and the application of the new cyanide process to the older workings, put new life into the State's mining interests. The development of sheep raising, the carrying out of irrigation projects, and the building of transcontinental railroad lines also contributed to this revival. For many years Nevada has offered laws to attract divorce seekers. The law of 1923 requiring only six months residence was changed in 1927 to require only three months, and in 1931 six weeks, at which time it became unnecessary to state the grounds for divorce unless the case were contested. In 1925 at Pueblo Grande, pre-historic cities of unusual interest were unearthed, some of the houses containing a score of

rooms. In 1936 work was completed on Boulder Dam, near Las Vegas, the highest dam in the world.

**Nevada City**, town, California, co. seat of Nevada co. At the time of gold discovery (1849-58), it was one of the important mining towns of the State; p. 2445.

**Nevada, University of**, a co-educational State institution established at Reno, Nevada, in 1885. It is the head of the State educational system. The University is supported by the land grant of 90,000 acres under the Morrill Act of 1862; by appropriations of the State Legislature; and by special funds.

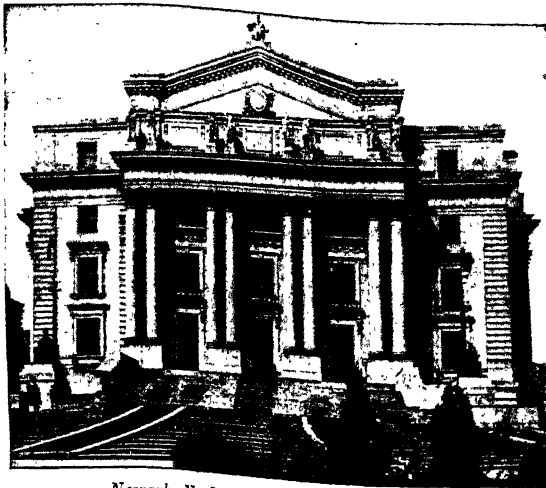
**Nevers**, town and episcopal see, capital of

*April; Boris*; and settings of children's songs by Stevenson.

**Nevis**, Leeward group, British West Indies: s.e. of St. Kitts, with which it is connected for administration. It is an extinct volcano (3,600 ft.), with cultivated slopes, bearing limes, oranges, and sugar cane. Charlestown, the chief town, is a port of entry. Nevis is subject to hurricanes (a disastrous one occurred in 1899) and earthquakes. Alexander Hamilton was born here in 1757. Area, 50 sq. m.; p. 12,700.

**Nevis, Ben.** See **Ben Nevis**.

**New, Harry Stewart** (1857-1937), American political leader, was born in Indianapo-



Newark, N. J.: Essex County Court House.

department Nièvre, France, at the confluence of the Loire and the Nièvre. The chief buildings are the Cathedral of St. Cyr (eleventh to fifteenth century); the Palais de Justice (1475), and the Church of St. Etienne dating from the eleventh century. The most famous product is majolica pottery; p. 27-328.

**Nevin, Ethelbert** (1862-1901), American composer, studied in Germany. In 1900 he became associated with the music department of Yale University. His piano works, all cast in miniature form, are characterized by dainty originality and exquisite melody. His *Water Scenes*, which include the popular *Narcissus* and the *En Passant* and *Tuscan* suites, are widely known. His best songs are *Lehn' deine Wang' an meine Wang'*; *The Rosary*; *I the Wondrous Month of May*; *'Twas*

*lis*, Indiana. He was a member of the State senate (1896-1900); vice-chairman (1904-07) and chairman (1907-08) of the Republican National Committee; United States Senator (1917-23); and Postmaster General of the United States (1923-29); U. S. Commissioner, Century of Progress Exposition, 1933, 1934.

**New Albany**, city, Indiana, co. seat of Floyd co., on the Ohio River, opposite Louisville, Ky., spanned here by a bridge three-quarters of a mile long. The Silver Hills form a beautiful semi-circle back of the city, and their summits afford extensive views. Marengo limestone cave and Wyandotte cave are in the vicinity. The city has important river traffic and is a manufacturing center. The leading products are leather, foundry and machine shop products, furniture, and lumber; p. 25,414.



**New Amsterdam**, name of New York City under the Dutch. See NEW YORK CITY, *History*.

**New Amsterdam**, seaport British Guiana, on the Berbice River, near the confluence of the Canje; 64 m. s.e. of Georgetown. Communication throughout the town is largely by means of canals.

**New Archangel**, former name of Sitka.

**Newark**, largest city of New Jersey, co. seat of Essex co., is situated on the Passaic River and Newark Bay; 8 m. w. of New York, with which it is united by ferries and tunnels. Its water-frontage is 10½ miles. The surface is mainly level, extending west to low hills, and covers an area of 23.4 sq. m., of which about one-fourth is salt marsh on Newark Bay. While Newark, with its suburbs, is in part a place of residence for New Yorkers, it is also one of the most important industrial cities in the United States. The shaded residential streets and parks are a marked contrast to the business sections. The main business thoroughfare is Broad Street, a straight line from Mt. Pleasant Cemetery on the north to the Lehigh Valley coal pockets on the south, except for the bend at Central Avenue. The railroads of the nation converge in the Newark meadows, where over 85 per cent of the rail traffic of the Port of New York passes to reach New York piers by means of light-erage. About one-half of all commuter passenger traffic to Manhattan goes through Newark. Two belt line railroads tap the principal trunk lines entering the port, reach every dock and warehouse in the Port area, and are equipped to handle 1,000 cars of freight daily. City and Federal Government have both made heavy contributions in constructing the most modern rail-to-keel terminal facilities. Shipments can be intercepted at Newark for export, coastwise shipment, or domestic distribution with no re-handling or lighterage. The Newark Municipal Airport (400 acres) is the United States air mail terminal for the New York metropolitan district. It is said to outrank any other airport in the United States as a center for regular passenger and mail-airlines.

In 1932 a super-highway, more than 3 m. long, was opened, linking Newark and Jersey City, providing 135-ft. clearance of the Passaic and Hackensack rivers, and carrying traffic to New York via the Holland Vehicular Tunnel under the Hudson River. This veritable bridge, costing \$21,000,000, provides five 12-ft. traffic lanes and speeds communication between Newark Airport and

Canal Street, Manhattan. Newark has approximately 950 acres of parks and parkways, besides county parks within the city limits, of which the largest were Branch Brook (277 acres) and Weequahic (323 acres). Notable monuments are an equestrian statue of Washington in Washington Park, the gift of Aaron Ward; a statue of Lincoln, in front of the County Court House; and statues of Seth Boyden, Frederick T. Frelinghuysen, General Philip Kearny, and Abraham Coles. Among Newark's notable buildings are the City Hall, the County Court House, the Public Library, the Post Office Building, the Kinney Building, and the buildings of the Prudential, Mutual Benefit, Firemen's and American Fire Insurance, and the Public Service Companies. The educational institutions include the Newark College of Technology, the Newark College of Pharmacy, the New Jersey Law School, the State Normal School. There are very fine high schools, some of which are devoted to industrial training. The public library operates a business branch, with a collection of statistical information on the industrial activities of the city. Hospitals include the City, Newark, Memorial, St. Barnabas', Beth Israel, and Homœopathic. There are a Roman Catholic cathedral and other churches, the more notable of which are Peddie Memorial, Trinity Cathedral, St. Paul's, and Old First.

Water is obtained mainly from Pequannock Valley watershed (city-owned), 22 m. n.e. of the city. An additional supply of practically equal magnitude comes from the Wanaque watershed, 21 m. n.e. of Newark, built and operated by the North Jersey District Water Supply Commission for Newark and 7 other municipalities.

Newark is one of the largest manufacturing cities of the United States, and is remarkable for the diversity of its industries. The leading industries are the manufactures of electrical machinery, apparatus, and supplies; paints and varnishes; leather tanning, currying, and finishing; foundries and machine shops; slaughtering and meat packing; and the making of chemicals; jewelry; and bread and other bakery products. The Port Newark Terminal is connected with Newark Bay by a branch channel 30 feet deep and 400 feet wide. The channel through Newark Bay is 30 feet deep and 1800 feet wide, and connects with New York Bay at Staten Island. Since development of this port began in 1914 the growth of its shipping has been remarkable. The commerce of Newark, both by

rail and water, is diversified. The city also has large banking and insurance interest. It is the nation's leading lumber port.

In 1917 Newark adopted the commission form of government in place of the old system of government by a mayor and common council. There are five commissioners, among whom all former municipal departments are divided. Upon the relinquishment of New Netherlands by the Dutch, the settlement of New Jersey was at once begun by the English. Newark was founded in 1666 by Puritan families from Connecticut, who moved from their former homes on account of dissatisfaction over the absorption of the New Haven colony by Connecticut. The settlers purchased substantially all of present Essex county, including the site of Newark, from the Indians for "fifty double hands of powder, one hundred bars of lead, twenty axes, twenty coats, ten guns, twenty pistols, ten kettles, ten swords, four blankets, four barrels of beer, ten pairs of breeches, fifty knives, twenty horses, 1850 fathoms of wampum, six ankers of liquor (or something equivalent), and three troopers coats." The place was first called Milford, but was later re-named after Newark-upon-Trent in England. The early government was mainly in accordance with Mosaic law. The College of New Jersey (now Princeton University), was located in Newark from 1747 to 1756. Its president then was Rev. Aaron Burr, whose son Aaron Burr, who became Vice President of the United States, was born in Newark. The town was ravaged by the British in the Revolution and a great deal of private property was destroyed. Newark was first incorporated as a town in 1712, receiving a second town charter in 1798, and was incorporated as a city in 1836. Newark was the home of Seth Boyden, inventor of the process for making patent leather and the process for casting malleable iron. In 1930 the Port demanded that more equitable lighterage charges be accorded it. A decision rendered in 1933 gave Newark an advantage denied her under former lighterage subsidy given each vessel at the Port of New York; (See NEW YORK PORT AUTHORITY) p. 429,760.

**Newark**, city, Ohio, co. seat of Licking co., is situated at the junction of three forks of the Licking River. A feature of special interest is Mound Builders' Park which contains a large mound, a mile in circumference, and other relics of the prehistoric Mound Builders. Newark is in a rich agricultural district and is a shipping point for agricul-

tural products, as well as a thriving manufacturing center, with widely diversified industries. In the vicinity are coal mines, gas and oil wells and moulders' sand. Newark has an airport; p. 31,487.

**Newark Series**, the oldest rock series of the Mesozoic era to be found along the Atlantic border region of the United States. Its exact correlation is somewhat uncertain, but its position is regarded as Triassic, based upon structural grounds. There are areas of these rocks in Nova Scotia, the Connecticut River Valley, New Jersey, Pennsylvania, Maryland, and Virginia. They are mostly sandstones, conglomerates, and shales, furnishing much brownstone for building purposes. The famous Palisades on the west bank of the Hudson River are formed by an escarpment of one of these intruded trap sheets. Several other ridges are the result of differential erosion on this series of sandstones and igneous sheets in New Jersey. The Newark series has only fresh-water and land type fossils.

**New Bedford**, city, Massachusetts, one of the county seats of Bristol co., on New Bedford Harbor, an arm of Buzzard's Bay. At the mouth of the Acushnet River; 13 miles southeast of Fall River. It is a port of entry and is served by steamships, bus and truck. A lighthouse 34 ft. high stands on Palmer Island, at the entrance to the harbor. Clark Point, on the west side of the entrance, is the site of Fort Rodman. The harbor was improved by the Federal Government, and the State of Massachusetts erected a modern pier. New Bedford is still represented in the whaling fishery and has a unique Whaling Museum; but this formerly important industry has largely given way to newer manufacturing interests. The city was formerly one of the chief centers of the United States for the manufacture of cotton goods and fine cotton yarns, and it still has among its varied industries, factories which manufacture textiles or yarns of silk, rayon, wool, or cotton. In 1652 colonists from Plymouth settled at the site of New Bedford, which was then included in the town of Dartmouth. The place was almost totally destroyed by the British in 1778. During the height of the whaling industry, which lasted from the middle of the eighteenth to the middle of the nineteenth century, New Bedford maintained fleets numbering 400 sail; p. 110,341.

**New Bern**, city, North Carolina, co. seat of Craven co., at the junction of the Neuse and

Trent Rivers. It is connected by steamer with New York, Baltimore, and Norfolk. The remains of Tryon Palace, the residence of the first royal governor are of special interest. New Bern is the distributing center for Eastern Carolina, and is a shipping point for lumber, fish, cotton, tobacco, and garden truck. The leading manufactures are lumber, veneer, men's clothing, handles, concrete products, medicines, pickles, soy bean oil, cottonseed oil, fertilizer, and bricks. The first settlement was made here by the Swiss in 1710. The city was the capital of North Carolina in colonial times, and was long the chief seaport of the State. During the Civil War it was captured (Mar. 14, 1862) by General Burnside; p. 11,815.

**Newberry, Truman Handy** (1864-1945), American public official, was born in Detroit. He was Assistant Secretary of the Navy (1905-08), and Secretary (1908-09), in the Cabinet of President Roosevelt; United States Senator from Michigan, term 1919-25; resigned 1922.

**New Brighton**, town, Richmond Borough, New York City, situated on the n.e. shore of Staten Island, 6 m. from the Battery, to which ferryboats run frequently. Here is located Sailors' Snug Harbor, founded in 1806 under the will of Robert R. Randall.

**New Britain**, city, Hartford co., Connecticut, is the seat of the State Normal School. It is a manufacturing center of importance, being particularly notable for its large output of hardware; p. 68,685.

**New Brunswick**, a province of the Dominion of Canada, bounded on the n. by Bay Chaleur and the province of Quebec, on the s. by Nova Scotia and the Bay of Fundy; on the e. by the Gulf of St. Lawrence and Northumberland Strait; and on the w. by the province of Quebec and the State of Maine. It includes the islands of Campobello and Grand Manan, situated near the entrance of the Bay of Fundy. Area, 22,710 sq. m. of land and 275 of water. The Gulf of St. Lawrence coast is low; the Bay of Fundy coast bold and rocky. The chief river is the St. John, 450 m. long, navigable 88 m. to Fredericton. The coast line of 545 m. is indented by bays and fine harbors, some of which, like St. John, are never closed by ice.

The temperature in summer averages from 60° to 65° F., and in winter 15° to 25° F. The average rainfall is 42 inches; the snowfall is heavy—more than 100 inches in the north. Winters are cold and long in the north and in the interior, but much milder

near the shore, particularly near the Bay of Fundy. The best farming lands are in the valleys of the St. John, Kennebecasis, and Petitcodiac rivers. Near the Nova Scotia border, many acres of exceedingly rich marsh land have been reclaimed from the sea by the construction of an extensive system of dikes. The flora and fauna are for the most part similar to those of the neighboring provinces of Quebec and Nova Scotia. The principal varieties of trees are spruce (27 per cent), white birch (16 per cent), yellow birch (14 per cent), hemlock, fir, cedar, beech, ash, oak, and poplar. Game-birds are abundant, and include wild ducks, wild geese, teal, partridges, woodcock, plover, and snipe. New Brunswick is the sportsman's paradise, especially for moose, deer, and caribou. Magnificent trees cover about 80 per cent of the province, of which approximately one-half is crown forest. The largest area set apart by the government is in Restigouche, Gloucester, Northumberland, and Kent Counties. About 10,000 sq. m. have been leased to private individuals and corporations. There are few regions where logs cannot be driven to destination by waterways. New Brunswick ranks high in Canada in lumber, in laths, and in shingles. At the sources of the Tobique, Nipisiguit and Miramichi rivers is an immense forest set apart as a game and fish preserve.

There are probably 1,000 fur farms in New Brunswick; silver black fox predominating, with muskrat and beaver on the increase. Trappers bring in large numbers of silver fox, red fox, weasels, mink, black bear, otter, raccoon, skunk, wild cat, bear, lynx, marten, fisher, and rabbits. The annual value of the tourist trade is about \$18,000,000. Guides are licensed by the government. Moose and deer are said to be more numerous here than in any other part of the continent. Game refuges and wise laws protect them. Bears are numerous. Geese, duck, woodcock, coots, snipe and partridges abound. Canoeing through dense forests, fishing on lakes and rivers for salmon, trout, or bass, bathing beaches at ocean resorts, and deep-sea fishing lure visitors, especially from the United States.

Both the inland and seacoast fisheries are valuable. Fishing rights on the headwaters of the Restigouche are leased by the provincial government. Here and in the St. John and Miramichi rivers' salmon abound. Northumberland Strait is world-famous for lobster. The Bay of Fundy, in Charlotte County, for

herring, and the vicinity of the mouth of the Mirimachi River for smelts. New Brunswick is the largest Canadian producer of oysters, clams, and quahaugs. Scallops, cockles, and winkles also abound. The annual catch includes cod, whales, and other deep-sea fish. Gypsum deposits are practically inexhaustible; large quantities are calcined and made into plasters and cements. Coal is mined in the Minto area (400 square m.) where are reserves of 233,000,000 tons of average bituminous variety. There are reserves of about 13,000,000 tons also in Kent and Kings counties. Rights to oil and gas of Stoney Creek field (10,000 sq. m.) near Moncton belong to one company until the year 2,006. Granite and sandstone are important. Limestone is pulverized for fertilizer. Clays for pottery, abrasives, salt, potash, diatomite, peat, manganese, sand and gravel, and stone are also produced.

The soil, except in the hilly tracts, is fertile and agriculture is the chief occupation. The leading field crops, in order of importance, are hay and clover, oats, potatoes, and buckwheat. Wheat and barley can be successfully cultivated. New Brunswick apples have a reputation for flavor and high color, and raspberries, strawberries, blueberries, and cranberries thrive. Soil, climate and crops are ideal for stock; pasture lands are abundant. Sheep have always been numerous, much of the wool clipped being used in homespun. In the cattle industry milk cows predominate and dairying is profitable. Yorkshire hogs are valuable in mixed farming. Horses are bred in increasing numbers.

The Canadian Pacific Railway extends from St. John to Maine, and so furnishes transportation in the western part of the province. The Canadian National extends from St. John to Nova Scotia and also along the Gulf Coast and from Moncton to the Quebec border. St. John is connected with Europe, the United States, Nova Scotia, the West Indies, and South Africa by steamships. The most important manufacturing commodities are wood products. St. John and Moncton are the principal manufacturing centers, and St. John is the leading seaport. Its splendid harbor is always open and has grain elevators and loading berths. There is an airport at Moncton.

The 1931 Canadian Census showed the population of New Brunswick as 408,219. About one-third of the total were of French descent, who prefer the counties bordering the St. Lawrence Gulf and engage princi-

pally in agriculture and fishing. The predominating strain is English.

Education is administered by a department through a council, with a Superintendent of education as the chief executive. The schools are nominally non-sectarian, but in the larger towns the Roman Catholics have really separate schools. Higher education is provided in the University of New Brunswick at Fredericton; Mt. Allison University at Sackville; the University of St. Francis Xavier, at Antigonish; and St. Joseph's College at Memramcook.

The government is vested in a Lieutenant-Governor appointed by the Governor-General of Canada assisted by an executive council. The Legislative Assembly of 48 members is elected by the people for 5-year terms. New Brunswick elects 10 members to the Dominion House of Commons, and is represented in the Senate by 10 members.

The colony formed part of Acadie from 1620. The struggle between the French and the English for the control of North America affected the fortunes of Acadie, which finally became a British possession in 1713 by the Treaty of Utrecht. The colony really began its existence with the arrival of over 5,000 United Empire Loyalists in 1783. In 1784 New Brunswick split off from Nova Scotia and became a separate province. Both New Brunswick and the State of Maine claimed the fertile Aroostook Valley; but through arbitration the greater part was awarded to Maine by the Ashburton Treaty of 1842. In 1867 New Brunswick was one of the four provinces which united to form the Dominion of Canada.

**New Brunswick**, city, New Jersey, co. seat of Middlesex co., on the Raritan River at the head of navigation, on the Delaware and Raritan Canal. It is the seat of Rutgers University, of the New Jersey Agricultural College, Rutgers Preparatory School, the New Jersey College for Women, the Reformed Theological Seminary, and the New Jersey Agricultural Station. A modern stone bridge crosses the Raritan River. Of historic interest is Buccleuch Mansion, in a park of 100 acres. New Brunswick was settled in 1681, incorporated as a town in 1730, and as a city in 1784. During the Revolution the British occupied the town in the winter of 1776-7; p. 33, 180.

**New Brunswick, University of**, at Fredericton, capital of New Brunswick, Canada, was founded as the College of New Brunswick in 1800, incorporated by royal charter

as King's College in 1829, and became the University of New Brunswick in 1860.

**Newburgh**, city, Orange co., New York, on the w. bank of the Hudson River. It occupies the side and summit of a steep slope rising from the river, and affords a fine view of Newburgh Bay, and of the picturesque peaks of the Highlands. The old Hasbrouck House, Washington's headquarter. in 1782-3, is in the custody of the State, and is visited by thousands every year. It is surrounded by a public park, and on the river side is a statue of Washington in the center of a structure of field stone known as 'The Tower of Victory.' Downing Park is the show spot of the city. Newburgh was settled in 1709. After the Revolution it was the headquarters of the Continental Army until its disbandment; p. 31,883.

**Newburyport**, city, Massachusetts, one of the county seats of Essex co., near the mouth of the Merrimac River, is a busy industrial city and port of entry. The leading manufactures are shoes, silverware, cotton goods, combs, electrical goods. The township was settled in 1635; p. 13,916.

**New Caledonia**, island, belonging to France in the Western Pacific Ocean; 700 m. e. of Queensland, Australia. It has an area of 8,548 sq. m. The Loyalty Islands (800 sq. m.), Isle of Pines (58 sq. m.), Wallis Archipelago (40 sq. m.), and some others are politically dependent upon New Caledonia. Forests cover 500 sq. m. More than half the island is mountainous; about 1,600 sq. m. are fit for pasture; and a like area for agriculture. The entire island is surrounded by coral reefs. There are good harbors on the eastern coast. Nouméa, the capital, on the southwest coast is the chief seaport. A narrow-gage railway runs from Nouméa to Paita (20 m.), and motor buses to Muéo. For the rest, the island has only cart-roads. Steamers carry mail to coast villages. There are monthly and irregular steamship service to Sydney, N. S. W. The climate of the island is excellent, and the fertile soil grows coffee, copra, cotton, manioc, maize, tobacco, bananas, pineapples, grapes and sugar cane. Cattle and sheep are raised. The mineral wealth is very great: chrome, cobalt, nickel, iron, and manganese abound. Antimony, mercury, cinnabar, silver, gold, lead and copper occur. Turtle and fish are abundant. Discovered in 1774, the island was annexed in 1853 by France; p. about 60,000.

**New Castle**, city, Indiana, co. seat of Henry county. It has rolling mills and

manufactures of automobiles, pianos, lumber, etc. One of the most important industries is the growing of flowers, New Castle being known as the 'Rose City of Indiana'; p. 16,620.

**New Castle**, city, Pennsylvania, co. seat of Lawrence co., on the Chenango River. New Castle is the shipping point of an extensive agricultural belt, and coal and iron, clay, limestone, and sandstone are abundant in the district. Tin plate, pottery, cement, fire brick, steel and other metal products are manufactured; p. 47,638.

**Newcastle**, town, New Brunswick, Canada, county seat of Northumberland co., on the Mirimachi River; the center of the big game country of New Brunswick; p. 3,383.

**Newcastle**, a port of New South Wales, at the mouth of the Hunter River; the chief port of the northern coast. Coal and wool are the main exports; p. inclusive of the suburbs, 103,700.

**Newcastle**, capital of Newcastle district, near the extreme n.w. of Natal, South Africa; situated on the Klip River coal field, which extends from Newcastle to Elands-laagte.

**Newcastle**, district in n.e. of New South Wales, Australia, traversed by the great Dividing Range. It forms a table-land 3,000 ft. above sea level, and has an area of 13,100 sq. m. The climate is genial, but severe in winter. Silver and tin are found; sheep and cattle raising are the principal occupations.

**Newcastle-upon-Tyne**, city, municipal, county, and parliamentary borough, England, in Northumberland co., on the River Tyne; 10 m. from its mouth. The town is on rising ground on the north bank of the river, here crossed by five bridges connecting it with Gateshead in Durham. Another High Level (railway) Bridge was opened by King Edward VII. in 1906, and the New High Level Bridge (1928). The castle, of which the keep remains, was founded about 1080, and rebuilt by William Rufus, afterward rebuilt or strengthened by Henry II. The town is exceptionally well provided with parks. The Church of St. Nicholas, since 1882 the Cathedral of Newcastle, dates from the fourteenth century, and has a beautiful fifteenth-century spire. The Side is a narrow and very steep street retaining Elizabethan houses. Certain narrow and steep streets, sometimes rising in steps, are called 'chares.' Newcastle has large shipbuilding yards, where battleships and merchant vessels of all classes are constructed. The Elswick engineering and

steel works, besides additional works at Scotswood to the west, turn out all kinds of heavy ordnance. Locomotives, marine engines, machinery, heavy iron and steel goods, plate and crown glass, earthenware, chemicals, and carriages represent other branches of manufacturing industry. Coal is by far the most important export. There are large docks and quays; p. 290,400.

**Newchwang**, a treaty port of Manchuria (Manchukuo) on the river Liao, about 30 m. from its mouth, where the real port, Yingkow is situated, and to which the name of Newchwang was extended by European settlers. Under the Treaty of Tientsin (1858) Newchwang was opened to foreign trade in 1864. The port was captured by the Japanese in 1895; but Russia connected Newchwang with the Siberian Railway, and held dominant influence there until the city was again taken by the Japanese in 1904 and restored to China. With the creation of a new State, Manchukuo, on March 1, 1932, Manchuria became independent of China. The importance of Newchwang faded and the status of its port, Yingkow, as a port was established.

**New College**, Oxford University. See **Oxford**.

**Newcomb, Simon** (1835-1909), eminent American astronomer, was born in Wallace, Nova Scotia, of New England descent. At the age of 25 he received an appointment as professor of mathematics in the U. S. Navy, and was assigned to duty at the Naval Observatory in Washington. Sixteen years later he was placed in charge of the Nautical Almanac Office of which he remained director from 1877 to 1897, when, having reached the age of sixty-two, he was placed on the retired list, with the rank of rear-admiral. The first of his work to call attention to his genius for astronomical research was published in 1860. He was secretary of the Transit of Venus Commission (1871-4), and was in charge of an expedition to Cape Town to observe the transit of 1882. He made an accurate determination of the velocity of light, and in 1897 redetermined the sun's parallax from all existing data. He was instrumental in having a fundamental catalogue of stars, tables of the sun and planets and constants universally adopted by the various national observatories. His most valuable contribution to the lunar theory related to the action of the planets on the moon; while from all available eclipses, and occultations of fixed stars, he improved the

lunar tables. He supervised the construction of the 36-inch equatorial telescope in the U. S. Observatory; and was also consulted in the erection of the 36-inch telescope, and the establishment of the Lick Observatory. From 1884 to 1894 he was professor of mathematics and astronomy at the Johns Hopkins University, and editor of *The American Journal of Mathematics*; and he was honored by all the important scientific societies of the world. He was the only American besides Benjamin Franklin to become an associate of the French Institute.

**Newcomb Memorial College**. See **Tulane University**.

**Newcomen, Thomas** (1663-1729), English inventor of the atmospheric steam engine. With Savery and John Calley, or Cawley, Newcomen took out, in 1705, a patent for what was called a 'fire engine.' In 1723 he set up an engine for drawing water at Griff, near Coventry. See **STEAM ENGINE**.

**New Deal**. See **United States History**, **New Deal**.

**Newell, Frederick Haynes** (1862-1932), American hydrographer was born in Brayford, Pa. He was assistant hydraulic engineer of the U. S. Geological Survey (1888-90), hydrographer (1890-1902), and chief engineer (1902-07); and from 1907 director of the U. S. Reclamation Service.

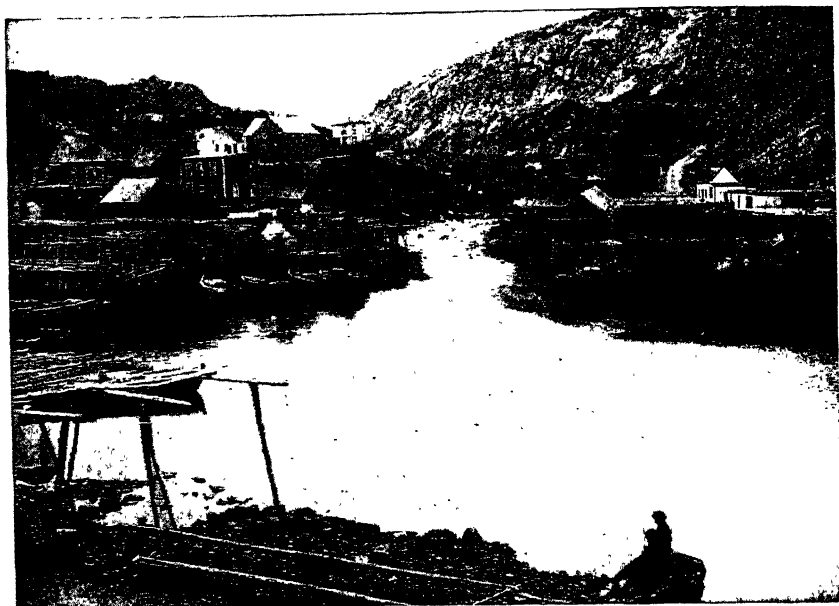
**Newell, Peter (Sheaf Hersey)** (1862-1924), American illustrator and author, was born near Bushnell, Ill. He removed to New York, where he gained a wide reputation for his grotesquely humorous drawings. Many of these have been collected as *Topsys and Turvys* (1893-4); *A Shadow Show* (1896); *Peter Newell's Pictures and Rhymes* (1899). He wrote *The Hole Book* (1908); *The Slant Book* (1910); *The Rocket Book* (1912); and illustrated Stockton's *Great Stone of Sardinia*, Twain's *Innocents Abroad*, Bangs' *Houseboat on the Styx*, and other books.

**Newell, Robert Henry** (1836-1901), American humorist, was born in New York City. He was literary editor of the *New York Mercury* from 1859 to 1863; member of the staff of the *New York World* from 1864 to 1866, and subsequently editor of *Hearth and Home*.

**New England**, a collective name given to the six Eastern States of the United States—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. In 1614 Captain John Smith made an extensive exploration, and suggested that the region be called 'New England.' The permanent settle-

ment by the English dates from 1620, when the Plymouth Colony was founded in what is now Massachusetts. The State of Connecticut was formed by the union of the colonies of Connecticut and New Haven; Massachusetts from those of Massachusetts Bay and Plymouth. The commonwealth of Vermont was constituted at the beginning of the Revolutionary struggle out of territory which had been claimed by New Hampshire and New York. Maine belonged to Massachusetts until 1820.

ft. high. Lakes, ponds, and streams are numerous. Grand Lake, the largest, is 56 miles long, and has an area of about 200 sq. m. The principal rivers flow toward the n.e. The climate is mild and bracing, and is not subject to extremes of heat and cold. In winter the thermometer seldom falls below zero. On the east coast there are occasional foggy days, but these are rarely encountered in the interior or on the west coast. The fisheries of Newfoundland are its chief source of wealth—more than one-fourth of the in-



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Newfoundland: Quidi Vidi, a typical fishing village.

**New England Primer**, a remarkably popular school book, first published in Boston by Benjamin Harris about 1690. It became the standard beginner's school book for the New England colonies.

**New Forest**, a woodland region in s.w. Hampshire, England, comprising 92,365 acres of crown forest, private property, and freehold and copyhold property of the crown.

**Newfoundland**, island and British colony in North America, situated at the mouth of the Gulf of St. Lawrence. Its area is 42,734 sq. m. Labrador, with an area of 110,000 sq. m., is a dependency. The coast line is extremely irregular. The coast is rugged, with bold rocky cliffs from 200 to 400

habitants being engaged in catching fish or preparing them for exportation. The shore fishery is carried on directly from the coast, and forms the principal branch of the cod industry. From May to October the Grand Banks are dotted with the staunch craft of the bank fishermen, who obtain their catch chiefly by means of trawls. Newfoundland has long been the greatest salt-dried codfish country, exporting about 18,000,000 pounds annually. Herring, salmon, and lobsters are also exported. Most of the important minerals are found in Newfoundland, yet it is not a rich mineral country. Few profitable mines are developed. The chief mineral product is red hematite iron from Bell Island

and Conception Bay, said to be one of the world's greatest iron deposits. Land eminently suitable for agricultural purposes is found in the river valleys, around the bays, and over nearly all the western part of the island. Potatoes, cabbages, and other root crops are grown. Pasture for sheep is abundant; cattle, horses, and swine are raised. Newfoundland has been important in transatlantic flight, since from Harbor Grace is the shortest route across the North Atlantic. Lumber, pulp and canned goods are exported. Among articles made for local consumption are boots and shoes, biscuits and ship's bread, tobacco, butterine, clothing, lines, nets, rope and twine. Water power is being developed to meet requirements of industry and is easily available. In 1933 financial conditions became so precarious that the dominion appealed to the British Government. A Royal Commission recommended abandonment of Dominion status, by which Newfoundland reverted to the rank of a Crown Colony. A British governor and a commission of three Britons and three Newfoundlanders were appointed.

Education is denominational, the government making an annual appropriation which is divided among the denominations on a per capita basis. John Cabot, a navigator in the service of England, reached the New World not far from the coast of Newfoundland in 1497. English, Spanish, French, and Portuguese fishermen for a long period had rival fleets in the cod-fishing grounds. The Treaty of Utrecht in 1713 recognized the rightful sovereignty of Queen Anne, and this was subsequently confirmed by the treaties of 1763 and 1783. In 1890 a temporary arrangement was made by which conflicting French and Newfoundland interests were left undisturbed, pending a final settlement. This was accomplished by the Anglo-French Convention of 1904. For several years there was a sharp dispute between Newfoundland and the United States as to the right of American fishermen to engage in the winter herring fishery on the western coast of Newfoundland. In 1910 the points of contention were settled by The Hague Tribunal. In 1933 the British Parliament saved Newfoundland from bankruptcy; in 1941 the U. S. was granted important air bases; p. Newfoundland, 295,000; Labrador, 4,700.

**Newfoundland Dog**, a dog originating in Newfoundland and Labrador, where it first appeared in the sixteenth century as the result of a cross between dogs introduced by

European fishermen and native sledge dogs. It is essentially a water dog. The Labrador retriever is undoubtedly a descendant of the Newfoundland crossed with the curly-coated retriever.

**Newgate**, a former prison in the city of London, begun in the reign of Henry I. (1100-35), destroyed in the great fire of 1666, and rebuilt in 1770. In 1902 it was demolished to make room for the Central Criminal Court.

**New Guinea**, the largest island on the globe after Australia and Greenland. It forms a part of the East Indian or Malay Archipelago, lying just n. of Australia. Estimated area, 91,000 sq. m. The island is divided politically between the Netherlands (west) and Great Britain. Its interior is for the most part rugged and mountainous. The principal rivers, most of which are navigable, are the Mamberamo, the Sepik, the Digul, and the Fly. The rainfall in general is abundant. The climate varies from the tropical heat of the plains to the region of eternal snows. The flora resembles that of the Malayan Islands, but includes certain Australian forms, as the eucalyptus, and alpine varieties, as rhododendrons. The mammalia is scanty, consisting chiefly of marsupials; but wild pigs, foxes, and cassowaries occur. Birds are extremely numerous and include the bird of paradise. The land is rich in minerals, a few of which are exploited. Difficulty in transportation retards mining development. The chief exports are copra, gold, rubber, desiccated coconut, copper, and trochus and trepang. The natives belong to the Melanesian division, and are usually classed under the name of Papuans. New Guinea was discovered in 1511 by Antonio d'Abreu and was visited by Saavedra, Torres, Bougainville, Captain Cook, and others. In 1888 it was made a British colony. In 1906 it became a territory of the commonwealth of Australia under the name of Papua. Dutch New Guinea is a part of the residency of the Moluccas—headquarters for North New Guinea being at Ternate: for South and West New Guinea, at Amboina. It includes about one half the island. It has practically no industry and is little explored. Former German New Guinea included Kaiser Wilhelms Land, Bismarck Archipelago, Caroline, Pelew, Solomon, and Marshall Islands. Following the war a mandate from the League of Nations (Dec. 17, 1920) assigned to Australia, Kaiser Wilhelms Land, the Bismarck Archipelago, and the Solomon Islands. The population of the island, as estimated in 1939, was 632,000. Partially



occupied by the Japanese in early 1942, New Guinea was an important scene of conflict in World War II.

**New Hampshire** (popularly known as the 'Granite State'), one of the North Atlantic States of the United States, belonging to the New England group. It is bounded on the n. by the province of Quebec, Canada; on the e. by Maine and the Atlantic Ocean; on the s. by Massachusetts; and on the w. by Vermont. With extreme dimensions of 178 miles and 88 miles, New Hampshire has a total area of 9,031 square miles, of which 301 are water. A mountainous area crosses the State from n.e. to s.w. on a line nearly parallel to the western border. The plateau region of the White Mountains, covering an area of 1,300 sq. m. with an average elevation of from 1,600 to 1,800 ft., occupies the north central part of the State. Mount Washington (6,293 ft.) is the highest, being the loftiest mountain in the northeastern part of the United States. The Connecticut River rises in the northern part of New Hampshire, and more than half of its course is along the border of the State. According to a recently completed survey, New Hampshire has 1291 picturesque lakes and ponds, many of them famous summer resorts. Lake Winnepesaukee is the largest, being 20 m. long and averaging 5 m. in width, with over 250 islands. The climate of New Hampshire is rigorous, but for the most part free from sudden changes. The chief mineral resources of New Hampshire are sand and gravel, granite, clay products and feldspar. Garnet, scythe-stones, and quartz silica are also produced. New Hampshire was originally covered with forests of white pine, spruce, and hemlock, with some hardwood trees in the southern part. The original growth of white pine which has been entirely removed is being reforested with white pine seedlings. The principal crops are hay and forage, potatoes, and oats. Orchards also yield a valuable crop.

The industrial development during the second half of the last century made manufacturing of more importance than agriculture in the economic life of the State. The greater number of the manufacturing establishments are located in the southern part, where they have the advantage of the abundant water power of the numerous streams, the excellent harbor of Portsmouth, and nearness to the commercial and industrial centers of Massachusetts. The manufacture of cotton goods and textiles, formerly the most im-

portant industry of the State, has in part given way to more varied lines. The manufacture of boots and shoes, and paper and pulp factories are also very important. Big specialties are also noted, such as the world's largest hosiery machinery manufactory, two of the principal producers of machine belting, and one of the chief sources of insulated electric wire for automobiles. New Hampshire also manufactures lumber and timber products, foundry and machine shop products, marble, slate, granite and other stone products. Manchester is the leading manufacturing center. General supervision of education is vested in a Commissioner of Education. The education and training of teachers is provided in the New Hampshire State Normal Schools, at Plymouth and Keene; while the cities of Concord, Nashua, and Portsmouth maintain city training schools. Higher educational opportunities are offered by the New Hampshire University at Durham; Dartmouth College at Hanover; and Saint Anselm's College (Roman Catholic), at Manchester. Phillips Exeter Academy at Exeter, and St. Paul's School at Concord, are well-known institutions.

The region now included in New Hampshire is believed to have been first explored by Sir Martin Pring in 1603. Originally a part of the First Charter of Virginia of 1606, and of the grant given to the Plymouth Company in 1620, it was in 1622 included in a grant made by the Council for New England to Captain John Mason and Sir Ferdinando Gorges. In 1629 Mason secured an individual claim to the portion of the granted territory between the Piscataqua and the Merrimac, and a few days later to a much larger tract, which extended to Lake Champlain. This was called New Hampshire, in recognition of his native English Hampshire. In 1686 New Hampshire, together with Massachusetts, Plymouth, and Maine, was placed under the jurisdiction of Sir Edmund Andros, appointed colonial governor by James II. When the Stuarts were deposed, Andros was driven out (1689). New Hampshire was governed by a new proprietor, Samuel Allen, from 1692 to 1698, after which it was for a short time under the jurisdiction of the Earl of Bellomont, governor of New York and Massachusetts. Legislation has kept pace with the general advance in State control of public utilities, and in the handling of economic problems. Direct primary nomination has been instituted; a forestry commission created; a State sanatorium for tuberculous

patients, with associated dispensaries, established; and the indeterminate sentence made a part of the penal code. New Hampshire experienced effects of the 1938 New England hurricane; p. 491,524.

**New Harmony**, town, Posey co., Indiana, on the Wabash River. In 1814 the Harmonists, a German communistic religious body on the model of the primitive church led by George Rapp came to settle here from Harmony in Pennsylvania; but the settlement was broken up. From 1825 to 1827 it was occupied by Robert Owen's community; p. 1,390.

**New Haven**, second largest city of Connecticut, county seat of New Haven co., situated 4 m. from Long Island Sound, at the head of an inlet known as New Haven Bay. The city covers an area of about 23 sq. m. It has broad streets and avenues embowered by fine old elms, Hillhouse Avenue being especially noted for its trees. The 'Old Green,' consisting of about 16 acres, is the civic center of the city. The City Hall, Ives Memorial Library (1911), designed by Cass Gilbert, a bank, three churches, new County Court House, the new Post Office and the Taft Hotel are situated on and around the Green; and on its west side, across College Street, are the campus and principal buildings of Yale University. Among the chief buildings on the quadrangle are South Middle College (the oldest building), the University Library, Battel Chapel, the Art School, and four large dormitories. Other important buildings of the University are the buildings of the Sheffield Scientific School, the Schools of Law, Medicine, and Divinity, the Chemical and Physical laboratories, Memorial and other halls. The famous Yale Bowl seats 74,000 persons.

New Haven is an important industrial city, and has a considerable trade. The leading manufactures are foundry and machine shop products (including hardware), printing and publishing, clothing, bread and other bakery products, electrical machinery, apparatus and supplies, cigars and cigarettes, cutlery and tools, furniture, sausage, meat puddings, headcheese, beverages, planing-mill products, surgical appliances. A considerable trade was early carried on with the West Indies, and the city now has commerce with the West Indies and with Canada. The harbor has a channel 400 ft. wide and 30 ft. deep; p. 160,605. In 1638 a colony made a settlement here under the leadership of John Davenport and Theophilus Eaton. In 1639 a government was

established under a written constitution. The New Haven colony was founded in 1643 by the union of Milford, Guilford, and Stamford with New Haven. Yale College, founded in Saybrook, was removed to New Haven in 1717.

**Newhaven**, seaport at the mouth of the Ouse River, Sussex, England; 9 m. s.e. of Brighton. The continental route *via* Dieppe is extensively used, and considerable trade is carried on with French ports. It was used as a naval base during the World War; p. 6,790.

**New Hebrides**, archipelago in the Pacific Ocean, about 850 m. e. of Brisbane. The islands of which there are 40 are of volcanic origin. The rich soil produces valuable woods including ebony, rosewood, sandalwood, etc. The natives are mostly Melanesians, with a few Polynesian groups. The total area of the archipelago is about 5,646 sq. m.; p. about 1,000 Europeans, 50,000 natives. By the convention of October, 1906, the New Hebrides have a joint French and English government, each country appointing a resident commissioner. The headquarters are at Port Vila.

**New Icarians**, a communistic society originating in France under the leadership of Etienne Cabet. The members emigrated to Texas in 1848 and thence to Illinois. Dissensions occurred in 1856 and again in 1879, and the society finally came to an end in 1901.

**New Jersey**, one of the North Atlantic States, of the United States. It is bounded on the n. by New York; on the e. by New York and the Atlantic Ocean; on the s.w. by Delaware Bay, an arm of the Atlantic Ocean; and on the w. by Delaware and Pennsylvania, from which it is separated by the Delaware River. The Hudson River, New York Bay, and Staten Island Sound separate it from New York. With extreme dimensions of 167 and 70 m., it has a total area of 8,224 sq. m., including 710 of water.

**Topography.**—Topographically New Jersey is divided into two parts, the southern section lying in the Atlantic Coastal Plain, and the northern section which constitutes a part of the Appalachian Highland. The former includes about three-fifths of the total area and is a low, undulating plain sloping toward the water, which surrounds it on three sides. The rivers of this section are numerous. The Appalachian Highland region includes the Piedmont Plain, which here is quite narrow and rises to a height of about 500 ft.; the New Jersey Highlands (Nave-

sink Hills), on the east coast; the mountain ranges of the northwest, and the basaltic ridges in the east. This northern portion forms a picturesque region of alternating hills and valleys. The large lakes of this region are more numerous than farther south; the chief being Lake Hopatcong and Greenwood Lake, the latter lying across the New York boundary.

*Parks and Resorts.*—The variety in topography has its counterpart in variety of pleasure resorts. High Point Park in the n.w. corner of the state reaches an altitude of 1,805 ft. This point affords magnificent views, attracting thousands of visitors. The site of the park of 11,000 acres, including a mansion later converted into a museum, was given to the state by Anthony R. Keuser in 1923. He also erected the monument to the soldiers and sailors of the state, which stands on the highest point in the park. In 1933, Congress established the first National Historical Park, to be set up at Morristown, N. J. There are numerous historical features here including the Ford House used by Washington in the Revolution. The shore line, with its long sandy beaches affords excellent location for seaside resorts. Of these, Atlantic City is world famous. It is built on an island, Absecon Beach, 10 m. long and  $\frac{3}{4}$  m. wide, which lies close to the mainland. The chief feature is the famous 'Boardwalk,' the promenade of the U. S., which extends for 8 m. along the ocean and reaches a width of 60 ft. From this walk six huge recreation piers extend over the water, approximately  $\frac{1}{5}$  m. to almost  $\frac{1}{2}$  m. The other side of the Boardwalk is lined with hotels, and other buildings, there being nearly 1,000 hotels in this city of about 68,000 permanent residents. The resident population is increased by visitors to about 300,000 in August and the average daily population is estimated at 100,000. The fact that the temperature is modulated in winter by the Gulf Stream and in summer by the nearness of water makes the location desirable as a year-round resort, both for pleasure and health.

*Climate and Soil.*—The climate of that portion of the State lying in the Coastal Plain is notably homogeneous. At new Brunswick the mean temperature is 28° F. in January and 74° in July, with extremes of -10° and 100°. The mean annual rainfall is 46.8 inches. The climate of the plateau region is marked by a lower mean in winter and a higher one in summer. A sheet of till of varying thickness covers a large portion of the

uplands of the State. In general, the soil is a composition of sand and clay, the dominant type being a sandy loam, which is light and easily tilled. Along the flood plains of the streams the soil is decidedly clayey and comparatively rich, but fertilizers are largely resorted to throughout the State.

*Geology.*—The geological formations represent almost all ages from the Archæan gneiss and granite of the Highland region to the very recent sand beaches of the coastal fringe. All of the southern part of the Coastal Plain region is composed of Tertiary sands and clays, while its northern part is composed of similar deposits of the older Cretaceous period. The Piedmont Plain is made up of Triassic formations of red sandstone and shales, with intrusions of igneous rocks and lava flow in the form of diabase, such as those composing the Palisades, Watchung Mountains, and Orange Mountains. In the northwest, Silurian and Devonian sandstones occur and limestones of the Palæozoic era. Glacial gravels cover a large portion of the northern section, and a terminal moraine, marking the southern limit of the great ice sheet, crosses the State at about 40°30' N.

*Mining.*—New Jersey is a leading State in clay products, including brick and tile, terracotta and pottery; in zinc ore; and in magnetite. Iron ore is also mined. The output of stone, including trap rock and of sand and gravel is considerable. Granite, sandstone and argillite are also quarried and deposits of talc and soapstone occur. Other mineral products are marl (greensand), lime, fuel briquets, cement, coke, ferro-alloys, pig-iron, graphite, manganiferous residuum, peat, and slate.

*Forestry.*—New Jersey originally was covered with forests, which in the northern part were composed chiefly of hard woods, and in the southern part of yellow pine, with white cedar in the fresh-water swamps. Most of the original growth of merchantable timber has been cut, but the second growth is now of considerable value, the chief species of hard wood being oak, maple, hickory, beech, tulip poplar and ash, and of conifers, pine, cedar and hemlock.

*Fisheries.*—New Jersey's streams and lakes are well stocked with trout, perch, bass, crappie, pike, and pickerel, and the sea fisheries are important. The shellfish products, oysters and clams, is the most valuable. The most important fish economically are weakfish, butterfish, flounders, sea bass, bluefish, whiting, and mackerel.

*Agriculture and Stock Raising.*—A farm survey completed in 1938, by the State Department of Agriculture, showed a total investment in farms and farm equipment of \$288,000,000 and a farm per acre value of \$144. Farm products in 1938 brought \$57,859,000, of which livestock and livestock products accounted for \$35,835,000. The principal crops, with the average annual acreage, yield and value of each are as follows: Hay, 386,000 acres, 405,000 tons, \$4,374,000; potatoes, 9,000 acres, 1,296,000 bushels, \$1,102,000; corn, 16,000 acres, 656,000 bushels, \$466,000; and apples, 623,000 bushels, \$748,000. New Jersey is famous for its poultry and eggs, and also for sweet potatoes. The raising of vegetables and the cultivation under glass of early small vegetables for the markets of neighboring cities are extensive and productive industries. New Jersey ranks among the leading States in the amount of its commercial tomato crop, averaging about 135,000 tons per year, and its output of canned tomatoes and soups is heavy. The growing of orchard fruits, especially peaches and apples, is extensively carried on. A large variety of small fruits is also raised—strawberries and cranberries being most important. New Jersey is also noted for its floriculture.

*Manufactures.*—New Jersey is pre-eminent a manufacturing State. It is favored by its position between two of the largest cities in the country (New York and Philadelphia), and has easy access, through its abundant railway facilities, to the sea on one side and to the coal fields of Pennsylvania on the other. The leading industries are petroleum refining, copper smelting, manufacture of textiles, silk, electrical goods, paint, chemicals, pottery, soaps, perfumes, and jewelry. There are important foundries, machine shops, canneries, rolling mills, meat packing houses, and gold and silver refineries. The leading manufacturing cities are Newark, Jersey City, Paterson, Camden, Trenton, Bayonne, Kearny, Elizabeth, Passaic, and Perth Amboy.

*Transportation and Commerce.*—In 1940 the railway mileage of New Jersey was over 2,000, being greater per unit of territory than in any other State. The steamers of a number of transatlantic lines sail from the Jersey side of New York Harbor. The State is connected with New York by tunnels and bridges and from these a magnificent highway system spreads over the State—some 16,000 m., mostly improved. A bridge connects the State with Philadelphia. At Newark in 1929 the

Metropolitan Airport was opened as an air-mail port for New York City. A United States naval air station is maintained near Lakehurst where the largest airships can be accommodated. Two canals have been of great importance in the transportation of coal. They are the Morris Canal, from Jersey City to Phillipsburg, and the Delaware and Raritan Canal, from New Brunswick to Bordentown and Lambertville. There are a number of ports of entry in New Jersey. Sea-going vessels now enter the Delaware River as far as Trenton. There is also commerce on the river between Philadelphia and Trenton.

*Population.*—According to the Federal Census for 1940 the population of New Jersey was 4,160,165. The population of the principal cities in 1940 was: Newark, 429,760; Jersey City, 301,173; Paterson, 139,656; Trenton, 124,697; Camden, 117,536; Elizabeth, 109,912; Bayonne, 79,108; East Orange, 68,945; Atlantic City, 64,094; Passaic, 61,394; Hoboken, 50,115; Union City, 56,173; Irvington, 55,328.

*Education.*—The Russell Sage Foundation has ranked New Jersey first among states east of the Mississippi in education, and fourth in the U. S. General supervision of educational interests is vested in a State commissioner of education and four assistant commissioners, and in a State board of education appointed for eight years. Schools must be open to all children from 5 to 20 years of age for at least nine months; and attendance is compulsory during the entire session for children from 7 to 14. In addition to the teacher-training institutions the following provide higher education: Princeton University at Princeton; St. Joseph's College at Princeton; Bloomfield Theological Seminary, at Bloomfield; St. Elizabeth College, at Convent Station; Upsala College, at East Orange; Stevens Institute, at Hoboken; Georgian Court College, at Lakewood; Drew Seminary, at Madison; New Jersey Law School, at Newark; New Brunswick Theological Seminary, at New Brunswick; Seton Hall College, at South Orange; Alma College, at Zarepath; and the publicly controlled Newark College of Engineering, at Newark and Rutgers University, at New Brunswick.

*Government.*—The present constitution is that adopted in 1844 and amended several times. Residence in the State one year and in the county five months and registration are prerequisite of voting. The legislature consists of a Senate having 21 members.

one for each county, elected for three years (one-third being chosen annually), and a General Assembly limited to 60 members, elected for one year. Regular sessions convene annually in January, and are not limited in length. Money bills must originate in the Assembly. The chief executive is the Governor, elected for three years, and not eligible for re-election for the succeeding term. A majority vote of all members elected to each house of the legislature overrides the governor's veto. The Secretary of State and the Attorney-General are appointed by the governor and senate for a term of five years. The Treasurer and Controller are chosen for terms of three years by the senate and general assembly in joint session. The judicial authority is vested in a Supreme Court, with a chief justice and eight associate justices appointed by the governor, with the advice and consent of the senate, for seven years; a Court of Errors and Appeals in the last resort, composed of a chancellor and six judges, besides the justices of the Supreme Court; a Court of Chancery; a Prerogative Court, with the secretary of state as register; an Orphans' Court, Circuit Courts, County Courts, and justices of the peace. The governor and judges of the Court of Errors and Appeals form a Court of Pardons. The senate is the court of impeachment, with the assembly as complainant. Under the Reapportionment Act New Jersey has 14 Representatives in the National Congress. Trenton is the State capital.

*History.*—Probably the first European visitor to the present territory of New Jersey was the Spaniard Gomez, who arrived in 1524-5. A Dutchman by the name of Van Putten built on the present site of Hoboken in 1640, and Dutch dominion over the territory was established by the expedition of Governor Peter Stuyvesant in 1655. Following the grant of the New Netherland region to the Duke of York by his brother, King Charles II., possession was taken in September, 1664, by an English fleet under Colonel Nicolls. The next year the Duke of York granted to Lord John Berkeley and Sir George Carteret a tract bounded on the east by the Hudson River and the ocean, on the south by the ocean as far as Cape May, on the west by Delaware Bay and River, and on the north by a straight line drawn from latitude 41° 40' N. on the Delaware to 41° on the Hudson. The beginning of this northern boundary was a disputed point until 1834, when it was fixed at 41° 21', its present loca-

tion. The name of New Jersey was given in commemoration of Carteret's loyalty to the crown during a former governorship of Jersey Island. Elizabethtown (Elizabeth) was founded in 1665, and Middletown and Newark in 1666. The Dutch still claimed the territory on account of the explorations of Henry Hudson, and again in 1673 took possession of it; but by the Treaty of Westminster, made with the English the following year, they relinquished their claim. The same year Berkeley sold his share to John Fenwick, by whom it was again sold in the following year. In 1676 a division was made by a line running from Little Egg Harbor to a point near the Delaware Water Gap—East Jersey being assigned to Carteret, and West Jersey to Quaker proprietors. William Penn and his associates soon bought out the rights of the two Quaker proprietors of West Jersey, and in 1682 purchased Carteret's right in East Jersey also. They did not, however, retain these rights; for in 1702 they ceded all jurisdiction to the crown, reserving their property rights only. This action made New Jersey a royal province, and it came under the jurisdiction of New York, but with a separate legislative body, until 1738, when a separate governor also was appointed. A new State constitution was adopted in 1844. In 1883 laws were passed regulating the labor of women and children in factories, and in 1884 a compulsory education law went into effect. The decade 1921-31 was an era of bridge and tunnel construction on a vast scale. Especially notable are the Camden bridge over the Delaware to Philadelphia and a railroad bridge across Newark Bay from Bayonne to Elizabeth (1926); Holland Vehicular Tunnel between Jersey City and Manhattan Island (1927); George Washington Bridge connecting Jersey City and Manhattan Island, New York (1931), the last costing about \$60,000,000. In 1928 Wanakee Reservoir was completed at a cost of \$29,000,000, having been 10 years in building. During 1928-32, New Jersey was joined to Staten Island by three new bridges, one at Elizabeth, another at Perth Amboy and the other at Bayonne. In 1939 the State Constitution was amended to legalize betting.

**New Jerusalem Church.** See **Swedenborgian Church.**

**Newlands, Francis Griffith** (1848-1917). American legislator.

**New London**, city, Connecticut, one of the county seats of New London co., on the Thames River, about 5 m. from its entrance

to the sea, and 45 m. e. of New Haven. It has one of the best harbors on the New England coast, and is midway between New York and Boston by water. The leading manufactures are silk and rayon, cotton goods, ship and boat building, foundries and machine shops (steel and wood), printing and publishing, paper boxes, bread and other bakery products, clothing, cordage and twine. New London is the central point of supply for the four forts which guard the eastern entrance of Long Island Sound. The first settlement was made in 1646, and the town was incorporated in 1784. It received its present name in 1658, before which it had been called Naumkeag. It suffered severely in the Revolution, when Benedict Arnold descended on the place with a considerable land and naval force (Sept. 6, 1781). An obelisk on Groton Heights commemorates the burning of the town by Arnold; p. 30,456.

**Newman, John Henry** (1801-90), English cardinal, was the eldest son of a London banker. In 1828 he was appointed vicar of St. Mary's, Oxford; and his estrangement from the evangelical school may be dated from this period. He wrote the hymn, *Lead,*



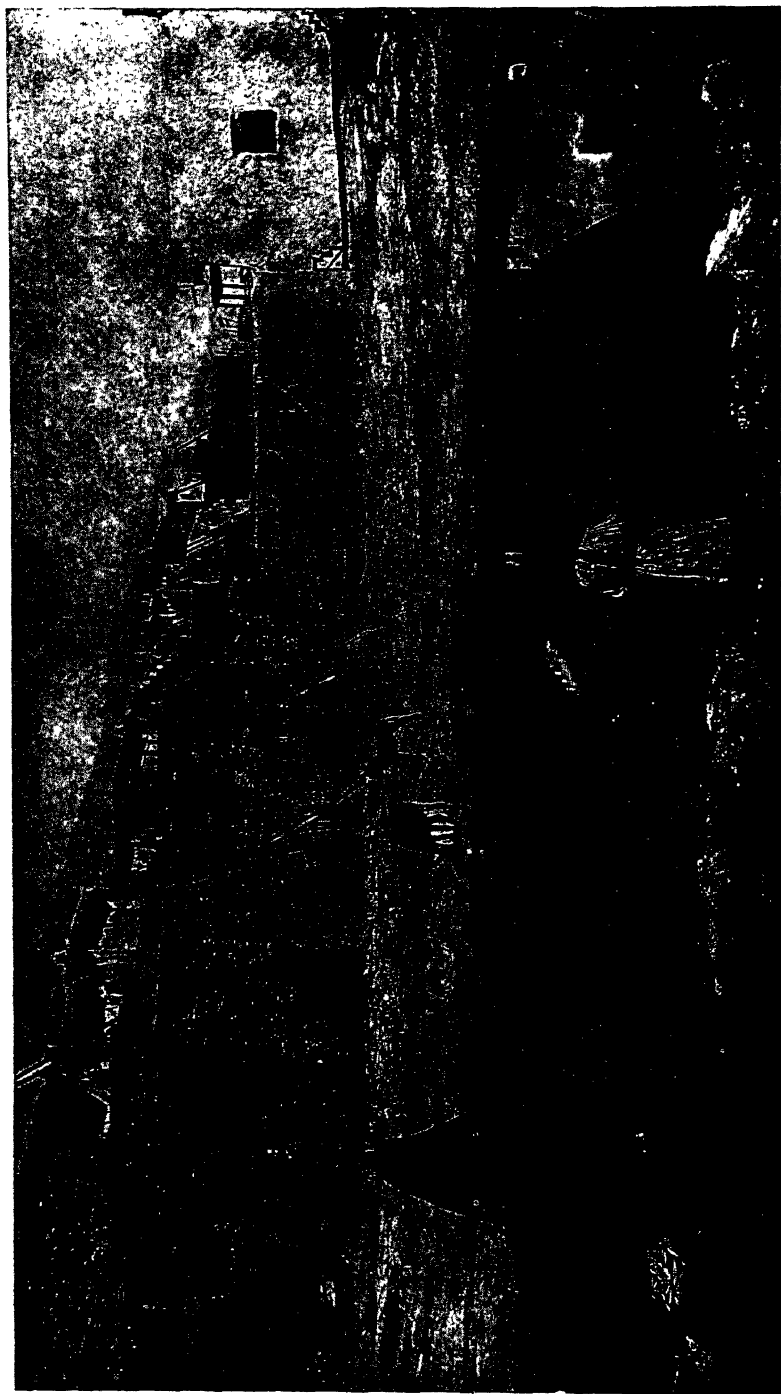
*Cardinal Newman.*

*Kindly Light* (1833) and *Tracts for the Times* were started by him in 1833. Eager for a reconciliation between the Roman and Anglican churches, he made in *Tract Ninety* (1841) an effort to show that the Thirty-Nine Articles were directed only against the popular errors of Romanism, and were to be inter-

preted, where necessary, in a sense other than that intended by their compilers. Amid the excitement which this tract occasioned, he retired (1842) to Littlemore, where he had established a small religious community; and there he completed (1845) his *Essay on the Development of Christian Doctrine*. In 1843, after resigning from St. Mary's, Newman retracted his adverse pronouncements against Rome, and in 1845 was formally received into the Roman Catholic Church. The London Oratory he established in 1850. In 1854 he was appointed rector of the new Catholic University at Dublin. In this position he published his *Idea of a University* and *Lectures on University Subjects* (1854-58). In 1864 he became involved in a notable controversy with Charles Kingsley, the result of which was the publication of Newman's *Apologia pro Vita Sua* (1864). Leo XIII. made Newman a cardinal in 1879. After this year his most noteworthy production was an article in the *Nineteenth Century* (1884), in which he betrayed an unexpected tolerance of modern Biblical criticism. As a Christian poet he ranks high; his contributions to *Lyra Apostolica*—above all, his Dantesque poem, the *Dream of Gerontius*—are perfect in expression, and exhibit strength and grace in rare combination. Consult Newman's *Letters* edited by Miss Mozley; *Ward's Life* (1912).

**Newmarket**, town in Suffolk, England; 13 miles northeast of Cambridge. It is noted for horse races held on the Heath, nearby, in April, May, July, September, and October; and here from 1,500 to 2,000 horses are usually in training. The Jockey Club has extensive premises. About 1½ m. west of the town is the ancient entrenchment called the Devil's Dike; p. 9,753.

**New Mexico**, a s.w. State of the United States. It is bounded on the n. by Colorado; on the e. by Oklahoma and Texas; on the s. by Texas and Mexico; and on the w. by Arizona. The Rio Grande River forms part of the southern boundary. The total area is 122,634 square miles, of which 131 are water surface. The State may be divided into three sections—the Rocky Mountains, and the regions to the e. and w. of them. Lying e. of the Rockies, and embracing about two-fifths of the entire area, are the Great Plains, with an elevation of 3,000-3,500 ft. In the s.e. corner lies part of the Llano Estacado or Staked Plains, a level, arid plateau. The Rocky Mountains enter the State at the northern boundary in an unbroken chain of lofty peaks, which extend in a southeasterly direc-



*Courtesy of the Atchison, Topeka and Santa Fe Railway Co.*

*New Mexico: The Pueblo Village of Acoma, with its crude adobe houses.*

tion for about 120 miles. A number of these peaks exceed 12,000 feet in height. The San Francisco Mountains and the Gila Plateau cross into Arizona. In the northern part the mountain ranges enclose beautiful grassy plains; in the southern part, lava plateaus and salt marshes. The northwestern part is a vast, arid plateau with an elevation exceeding 6,000 ft., dotted with sage brush. The loftier peaks of the n. central part attain elevations of 13,000 ft. and more. Flowing across the State between the numerous mountain ranges is the Rio Grande River. The northern part of the Plains region is drained by the Canadian and Cimarron, while the southern two-thirds is drained by the Pecos River. The San Juan and Chuska Rivers, tributaries of the Colorado, drain the northwestern portion; the Gila and its tributary, the San Francisco, the southwestern portion. The climate is dry, cool but moderate, and notably healthful. The mean temperature at Santa Fé is 28° F. in January and 68° in July, with extremes of -13° and 97°. The January average is 6° higher at Fort Stanton. The mean annual rainfall at Santa Fé is 14.2 inches, which is slightly higher than the average for the State. At no point is the rainfall sufficient for the needs of agriculture. The soil in the river valleys is fertile, and with irrigation produces abundant crops. The yucca and cactus are characteristic forms of vegetation. The Great Plains region and the northwestern portion are of Cretaceous formation. Between these areas and the mountain ranges are layers of Palæozoic sandstone and Carboniferous limestone, which have been broken through and thrust up by the granite and syenite upheavals of the mountain formations. At frequent intervals are intrusions of eruptive rock of various periods, the most recent being the lava beds of the southern and southwestern portions. Copper is the chief mineral wealth of New Mexico, but gold, silver, lead, zinc and coal are also mined.

**Forestry.**—Cottonwood, sycamore and oak trees grow in the river valleys, and the mountain ranges have extensive forests of yellow pine, spruce and cedar. Six national forests lie wholly within the State, and parts of two others, with a total area of 8,478,355 acres. Irrigation and dry farming have accomplished great results for agriculture in New Mexico, and give bright promise for the future. The principal crops are hay and forage, corn and wheat. Stock raising is also an important industry.

**Manufactures.**—Leading industries of New Mexico showed considerable development during the period of the World War, though manufacturing is still in its infancy. Leading industries include: lumber and lumber products; petroleum refining; printing and publishing.

**Population.**—According to the Federal Census of 1940, the population of New Mexico was 531,818. Of this total, foreign-born whites numbered 7,797; Indians, 28,941; Negroes, 2,850; Japanese, 249; Chinese, 133; Mexicans, 59,340; Filipinos, 27. The urban population, in towns and cities of at least 2,500 inhabitants, comprises 33.2 per cent. of the total. The population of the principal cities in 1940 was: Albuquerque, 35,439; Santa Fé, 20,325; Roswell, 13,482; Las Vegas, 12,362; Raton, 7,607. New Mexico has the county unit system of school administration, the county superintendent with four others appointed by the district judge constituting the county board of education which has entire control of rural schools within the county. Town and city schools are administered by municipal school boards. Schools must be open at least seven months each year, and attendance is compulsory for the same period for children from six to sixteen years of age. Other institutions of learning supported by the general fund include the University of New Mexico, at Albuquerque; New Mexico College of Agriculture and Mechanic Arts, at State College; the State School of Mines at Socorro. The present constitution of New Mexico was adopted in 1911. The State executive officers are elected for two years. They include the Governor, Lieutenant-Governor, Secretary of State, Auditor, Treasurer, Attorney-General, Superintendent of Public Instruction, and Commissioner of Public Lands. The Governor may veto any item of an appropriation bill. Under the Reapportionment Act New Mexico has one Representative in the National Congress. Santa Fé is the State capital.

**History.**—The aborigines of New Mexico were the cliff dwellers and the Pueblo Indians. The earliest explorers were the Spaniards, who long held possession of the region. Cabeza de Vaca and three companions explored the region of New Mexico and Arizona, and reached the City of Mexico in 1536. Juan de Oñate conquered New Mexico in 1598-9, and, in 1599, founded the first colony, San Gabriel. Franciscan friars established missions along the Rio Grande and Gila Rivers, and in 1630 had about 50 missions scattered



through New Mexico and Arizona. The founding of Santa Fé is generally placed in 1605-6. In 1680 a great Indian revolt, resulting in the expulsion of the Spaniards, occurred, and it was only in 1692-3 that the country was reconquered by De Vargas. In 1821 the vast region called New Mexico became a province of Mexico, which at that time secured its independence from Spain. At the close of the Mexican War (1848), this region became the possession of the United States by the treaty of Guadalupe Hidalgo, the government paying \$15,000,000 for the entire cession. By the Compromise Bill of 1850, the Territory of New Mexico was organized, its limits being changed by the addition of the Gadsen Purchase in 1853. In 1906 the electors of Arizona and New Mexico rejected the joint Statehood Bill proffered by Congress; in 1910 an enabling act to admit the two Territories as separate States was passed; and on Jan. 6, 1912, President Taft issued the proclamation that made New Mexico one of the United States. In May, 1916, work on the Elephant Butte dam was completed. The American Museum has recovered spearheads in New Mexico in strata of the earth's surface, indicating an antiquity of 20,000 years. In 1929, the Rio Grande River in New Mexico suffered the severest flood of recent historic times (300 years). In 1916, 1932, 1936, 1940 the Democratic candidate received the State vote; in 1920, 1924 and 1928 it was cast for the Republican candidate.

**New Mexico College of Agriculture and Mechanic Arts**, a co-educational State institution at State College, N. M., established in 1889 under the provisions of the Morrill Act of 1862. It has an endowment of over 100,000 acres of public land, and is supported by student fees, sale of farm products, special appropriations, and the Morrill and Hatch funds.

**New Mexico, State University of**, a co-educational institution of learning at Albuquerque, N. M., founded in 1889 and opened in 1892. It comprises a College of Letters and Science, the Schools of Engineering, Fine Arts (including music, drawing and painting), and Education, the Departments of Home Economics and Physical Education, and the Division of University Extension.

**Newnes, Sir George** (1851-1910), English publisher, was born in Matlock, Derbyshire. His first great success was the starting of *Tit-Bits*, a penny weekly, in 1881. His other newspaper enterprises included the *Westminster Gazette* (founded on Jan. 31,

1893), the *Strand Magazine*, the *Wide World Magazine*, the *Sunday Strand*, the *King and His Navy and Army*, *Country Life*, the *Ladies' Field*, *Woman's Life*, *Fun*, the *Home Magazine*, the *Captain*, *C. B. Fry's Magazine*, and the *Grand*.

**New Netherlands**, the Dutch territorial claim in America, based on the explorations of Henry Hudson. It extended from the 40th to the 45th parallel, lying between Virginia and New France. See **NEW YORK, History**.

**Newnham College**, an institution for the higher education of women situated in Cambridge, England. In 1875 Newnham Hall was opened and five years later Newnham College was established. Students have the same privileges as those offered at Cambridge, but instead of receiving degrees upon graduation, are given certificates.

**New Orleans**, the metropolis of Louisiana and the largest city in the Southern United States, is situated on both banks of the Mississippi River, 107 miles from its mouth, and 72 miles north of the Gulf of Mexico in a direct line. The Mississippi is its commercial front. From 5 to 8 miles distant is Lake Pontchartrain, a salt-water bay or arm of the Gulf, on which are situated suburban pleasure, yachting, and fishing resorts. Two canals, the Carondelet and the New Canal, connect with Lake Pontchartrain. The city has a land area of 199 square miles. The city is surrounded by water on nearly all sides, a fact which modifies the climate, both in summer and in winter. It is not subject to extremes of temperature, monthly averages ranging generally between 82° and 54° F. The average annual rainfall is 56 inches. Built in a bend of the river, New Orleans was originally crescent-shaped, whence it is called 'the Crescent City'; but it has since expanded and lost its original shape. The land lies several feet below the flood level of the river at high water, and is protected by dikes or levees; but it has been altogether free from river floods for over 80 years. New Orleans is divided into 6 municipal districts and 17 wards. The streets are laid out regularly. Canal Street, 176 feet wide, and running from southeast to northwest diagonally through the city, divides the old French or Creole quarter from the newer or American section. The picturesque French quarter is noted for its colored stucco and iron work. The finest residence streets are St. Charles Avenue, upon which are located also the buildings of Tulane and Loyola Universities,

and Prytania Street, in the American section, and Esplanade Avenue in the French quarter. Audubon Park, on the river front, has an area of 300 acres. It contains many handsome live oaks; a long artificial lake for boating and swimming; and a model sugar plantation, the Louisiana Sugar Experiment Station. The City Park, formerly the old duelling grounds, lies on Bayou St. John, in the heart of the city. Its area is 1,382 acres, one of the largest in the country, and contains a number of small lakes for rowing and fishing. New Orleans formerly possessed few large or imposing buildings, the soil being considered too soft. Better drainage, bringing about the drying of the soil, and the use of piles for the foundations, have resulted in the erection of edifices as high as 23 stories. Among the older edifices are the former Archbishop's Palace, built in 1730; the St. Louis Cathedral, erected originally in 1723, rebuilt in 1794 and 1850; the Supreme Court building, originally the Cabildo, or government house (1795); and the Civil Court building (1812). These four buildings, facing Jackson Square and of Spanish architecture, present an imposing appearance. The Custom House, of Quincy granite and Egyptian architecture, is one of the largest and finest government buildings in the United States. There are four higher educational institutions for white students in New Orleans, including Tulane University and Newcomb, for women; and four for Negroes—one, the Southern University, endowed by the State, the others denominational.

*Clubs, Carnivals, Etc.*—Originally a French or Creole city, New Orleans has become greatly Americanized in the last decade. The influence of the old French and Spanish *régime*, however, still survives in the architecture, mode of life, customs, social observances, and holidays. The last include 'All Saints' Day,' Nov. 1, when the entire population turns out to visit the cemeteries and decorate graves; and Mardi Gras, or Shrove Tuesday, the last day before Lent, and the last of the Carnival, when the entire city is given up to masking, parades, balls, and general merriment. A distinctive feature of the city is the carnival societies or clubs, giving balls, parades, or processions during the season, which are the social events of the year.

*Commerce.*—New Orleans is pre-eminently a commercial city, ranking seventh in the United States in net register of tonnage. Land and water terminal facilities are excep-

tionally good. The Mississippi River, 2,800 to 3,600 ft. wide, and 35 to 190 ft. deep, affords a landlocked harbor, safe from the tropical hurricanes that have devastated other ports of the Gulf of Mexico. The Mississippi and its tributaries afford 13,000 m. of interior navigation, an inner harbor or Navigation Canal six miles long, to connect Lake Pontchartrain, the Gulf, and the river harbor, has been constructed (1918-24). An extensive commerce is carried on with Mexico, Cuba, Central and South America and Europe. There is also a large coastwise trade with New York, Philadelphia, Florida ports, and Porto Rico. New Orleans is an important cotton market and conducts a large import trade in Brazilian coffee and mahogany. The exports include raw cotton, leaf tobacco, staves, lard, sugar, molasses cottonseed oil, cottonseed cake and meal. The population (1940) was 494,537. Of this number 346,801 were white; 146,374 were Negroes; and 1,362 were of other races. New Orleans is administered by a mayor and a board of commissioners.

*History.*—The site of New Orleans was visited in 1699 by a French expedition under Bienville, who in 1718 founded the city named after the French regent, the Duke of Orleans, and made it a few years later the capital of the French colony of Louisiana. It was ceded to Spain in 1763 but the Spanish governor, Ulloa, who arrived to take possession in 1766, was driven out by a popular uprising. In 1769 the Spaniards occupied the city, and shot the popular leaders. In 1800 New Orleans was ceded by Spain to France, and in 1803 passed with the Louisiana Purchase to the United States. The city was incorporated in 1805, when it had a population of 11,856. It was the capital of the State of Louisiana until 1852, and again from 1864 to 1880. Gen. Andrew Jackson defeated the British under General Pakenham on Jan. 8, 1815, in the Battle of New Orleans, fought just below the city limits. In April, 1862, New Orleans was captured by Admiral Farragut. Sanitary improvements and the drainage of the neighboring swamps have greatly bettered the health of the city, which formerly suffered from epidemics of yellow fever and from malaria.

*New Orleans, Battles of. War of 1812.*—During the War of 1812, the loyalty to the United States of the population of the Louisiana Purchase was doubted by the British, and an expedition against New Orleans was organized. Andrew Jackson, who was in command of the Department of the South

arrived in New Orleans on Dec. 2, and began energetic preparations for resistance. The British fleet of more than 50 vessels, carrying about 7,000 soldiers, reached Lake Borgne in December, and on Dec. 13 captured five American gunboats. Jackson, whose army amounted to scarcely 5,000 men, chiefly militia, was now reinforced by about 2,000 Kentucky militia; and Sir Edward Pakenham, brother-in-law of the Duke of Wellington, arrived with troops sufficient to raise the British forces to more than 10,000 veterans. The chief struggle took place on January 8, when the British were decisively defeated and General Pakenham was killed. General Lambert withdrew the British forces to Mobile, and captured Fort Bowyer—only to learn that peace had been declared on Dec. 24, two weeks before the attack on New Orleans.

**Civil War.**—During the Civil War, the main Confederate reliances for the defence of New Orleans were Forts Jackson and St. Philip, about 75 m. below the city and 25 m. from the mouth of the Mississippi, and a series of heavy chains which had been stretched across the river. On the morning of April 24, 1862, a United States squadron under Commander Farragut, to which was attached a flotilla of mortar boats under Commander Porter, succeeded in passing the forts. The city was compelled to surrender the next day, and was held by Gen. B. F. Butler. For the War of 1812 battle, consult Parton's *Life of Andrew Jackson*. For the Civil War battle, consult Mahan's *Admiral Farragut*; Soley's *Admiral Porter*.

**New Orleans University**, a co-educational institution for Negroes in New Orleans, La., founded in 1874, and under the control of the Methodist Episcopal Church.

**New Oxford Movement.** See **Buchmanism**.

**New Philippines**, a name sometimes given to the Caroline Islands.

**New Plymouth**, chief town and port of Taranaki provincial district, on the west coast of North Island, New Zealand; 160 miles southwest of Auckland. It is connected by rail with Raleigh and other points, and has an excellent harbor. It exports butter, cheese, bacon, and hams; p. 17,630.

**Newport**, city and port of entry, Rhode Island, county seat of Newport county, and until 1900 one of the capitals of Rhode Island, is situated at the south end of the State, inside the entrance to Narragansett Bay, 23 m. s.e. of Providence. It is widely famed as a summer resort. The U. S. Navy utilizes Nar-

ragansett Bay as a naval base, and it is considered one of the finest, most strategic and best protected harbors in the country. The old part of the town is contiguous to the harbor. It has many places of unique historic interest, and has narrow, picturesque streets. The fashionable streets, containing the 'summer cottages' and villas, extend toward the ocean side. Besides the beautiful summer residences, and several historic houses, a feature of interest is the Old Stone Mill in Touro Park, built probably about 1675. The Navy Department owns and operates the U. S. Torpedo Station which occupies Goat Island in the Harbor. Among other industries the fishing industry perhaps takes first rank. Newport was settled in 1639 by dissenters from the church at Plymouth, under the leadership of William Coddington. Before the Revolution it had become one of the chief seaports of New England, but at that time its commerce was destroyed and it remained stationary for a century. During the war it was occupied for three years by the British and for a while by the French under Rochambeau. During the World War a German submarine appeared outside the port in 1916 and sank nine vessels; p. 30,532.

**Newport**, munic. borough, Isle of Wight, England; 18 miles southeast of Southampton. The free grammar school dates from 1619, and here Charles I. signed the Treaty of Newport. The city is the commercial and industrial center of the island; p. 11,313.

**Newport News**, city, and port of entry, Warwick county, Virginia, on the James River, where it merges in Hampton Roads, 12 m. n.w. of Norfolk. Newport News is a ship-building and commercial center. It has one of the largest shipyards in the world, as well as foundries, a knitting mill, ice factories, and shirt and tobacco factories. The harbor is one of the finest on the coast, and the terminal facilities are of the best. Newport News was built in 1882, and incorporated in 1896; p. 37,067.

**New Providence**, one of the Bahamas.

**New Rochelle**, New York, Westchester co., on an inlet of Long Island Sound, a residential city, and the home of many New York business men. Fort Slocum, a U. S. Army post, is located at David's Island. It has a monument, on the Sound, commemorating the landing of the Huguenots; and a memorial monument to Thomas Paine. The principal establishments are the Knickerbocker Press, and manufactures of automobile speedometers, balances, and scales. New Rochelle

was founded in 1687 by Huguenots from La Rochelle, France; p. 58.408.

**News Agency**, an agency supplying news to periodicals, individuals, clubs, or other associations, as by telegram, cable, telephone, in proof, manuscript, by tape machine. In the United States news agencies are of two sorts. The Associated Press, organized in 1893 by 63 member newspapers, is a co-operative association with an elected membership which shares operation expenses. The United Press, organized in 1907 by E. W. Scripps,

the junction of the East Coast Dixie Highway and the cross-state highway to the gulf coast. The city lies in the famous Indian River orange district; p. 4,402.

**New South Wales**, the oldest state of the Commonwealth of Australia, lies between  $29^{\circ}$  and  $36^{\circ}$  s. lat. and  $141^{\circ}$  and  $154^{\circ}$  e. long. The Pacific coast line from Point Danger on the n. to Cape Howe on the s. is 683 m., and the width from e. to w. is 756 m. Area, 310,372 sq. m., including Norfolk and Lord Howe Islands. The chief natural feature is the Great



*Newport, R. I.*

Left, Broadway and old State House; Right, Residence of E. D. Morgan; Lower, The Cliff Walk.

has 'clients' instead of 'members.' Other great news agencies are Hearst's International and Universal News Services (1906), the Consolidated Press Service, and the Newspaper Enterprise Association.

**New Siberian Islands**, a group of uninhabited islands in the Arctic Ocean, n. of the mouth of the Yana, Siberia. Reindeer find pasturage here. Many mammoth tusks and remains of rhinoceroses and buffaloes have been collected. Total area, 9,650 sq. m.

**New Smyrna**, city, Florida, Volusia co., at the northern end of Indian River North, at

Dividing Range, which traverses the country from n. to s. (20 to 120 m. from the coast), with its highest points Mts. Kosciusko, 7,328 ft., and Townsend, 7,266 ft. The mean annual temperature is  $63^{\circ}$  F. at Sydney, July being the coldest and January the hottest month of the year. The rainfall varies from 10 inches in the interior to 8 inches at Sydney. The rainy season lasts from January to June.

Australia's main coal basin runs for about 200 m. along the seaboard of New South Wales. Gold is found in nearly all parts of the state. Silver was discovered in 1883; lead mining is centered at Broken Hill. Other impor-

tant metals mined are copper, tin, and zinc. The state also has great deposits of marbles, building stones, fire clays, slates, and precious stones.

Among the timber trees are the red gums and apple trees of the northern river flats, and the white iron bark, the blackbutt, the white mahogany, the tallow wood, the spotted gum, gray box, and varieties of gray and blue gums on the ridges and mountain slopes. On the northern rivers are brush forests of tall fern trees, palms, cabbage trees, the red cedar, the red bean, the beech, and the brown pine. Other important products of the brush forests are teak, cudgerie, red ash, and corkwood.

Nearly every kind of fruit and vegetable is grown in the state. The principal agricultural crops are wheat, maize, hay, sugar cane, oats, wine, rice, and potatoes; dairying is of great importance and extensive fruit culture (especially oranges) is carried on. New South Wales is essentially a pastoral country and is well adapted for sheep farming.

The chief imports are textiles, metal manufactures, machinery (electric and other), piecegoods, tea, printing paper, crude petroleum, and cinema films. The chief exports are wool, gold, copper, coal, wheat and flour, butter, eggs, meats, hides and skins, wine, fruit, and sugar. New South Wales' trade exceeds that of any other state of Australia.

The state possesses great natural harbors in Port Jackson (Sydney Harbor), Port Stephens, and Jervis Bay. Steamers leave Sydney for nearly all the ports of the world.

Primary education is compulsory for children between 7 and 14 years of age; this is free and non-sectarian in all state schools. The University of Sydney, established in 1850, has affiliated with it five denominational colleges.

The population is estimated at 2,770,000. The government is administered by two houses of Parliament, of which the Assembly is elected by the people. The executive power is in the hands of a governor appointed by the Crown, usually for five years, and a cabinet of ministers. The state capital is Sydney.

Botany Bay was discovered by Captain Cook in 1770, and in 1788 the first convict fleet arrived in New South Wales. The transportation of convicts ceased in 1840. Responsible government began in 1855. The Chinese Immigration Act came into force in 1862. From 1859 until 1875 the back country districts were terrorized by bushrangers who committed many murders and robberies. In 1901 New South Wales became a member of

the Australian Federation, and interstate free trade was instituted. In 1911 the Federal capital site was transferred to the Commonwealth, and the first Commonwealth wireless station was established near Sydney. In 1932, as the result of trouble over the state's default on interest on foreign holdings, Premier J. T. Lang was dismissed by the state governor, Sir Philip Game. See AUSTRALIA.

**Newspaper**, a publication issued at stated periods, usually daily; devoted to news, comments, and advertisements. The newspaper of today owes its immense circulation, and, therefore, its power to the web press, the telegraph, and the railroad. The modern press makes it possible to print hundreds of thousands of copies in less time than a few thousands were printed seventy-five years ago; the telegraph brings news of vital interest from far and near; the railroads distribute the product of the press to every hamlet of the civilized world.

The earliest newspaper is said to be the Chinese *Tching-pao*, or 'news of the capital,' which has appeared daily in Peking since about A.D. 750. In Europe the forerunners of the modern newspaper appeared in the 16th century as single sheets, issued at irregular periods, and sold by peddlers, some great event such as war, pestilence, or other disaster serving as a pretext. A number of such sheets, dating from 1498 to 1520, are preserved in German libraries. In them may be found accounts of the discovery of America. The *Courant*, or *Weekly Newses from Foreign Paris*, confessedly translated from the Dutch, and published by Nathaniel Butter, is the first example we have of an English newspaper. It bears date Oct. 9, 1621. In 1655 Cromwell proclaimed that 'no person whatever do presume to publish in print any matter of public news or intelligence without leave of the Secretary of State.' After the English Restoration a stringent Licensing Act was in force from 1662 to 1695. During the protectorate and the reign of Charles II., two papers only were issued with authority—the *Parliamentary Intelligencer* and *Mercurius Publicus*. Another official organ, the *London Gazette*, was published in 1665, and has ever since continued.

After the deposition of James II. the number of papers multiplied rapidly. In 1704 appeared *Dejoe's Review*; this was produced thrice a week, and by its style and character was a marked departure from all its predecessors. Two years earlier the first attempt at daily journalism had been made by the issuing of the *Daily Courant*. In 1709 there were eighteen

separate papers published in London, notable among them being Steele's *Tatler*, which appeared thrice a week, and which in 1711 was succeeded by the non-political *Spectator*. The venomous tone of the press in those days was its principal characteristic, and almost justified the act of ministers in imposing, in 1712, a stamp duty on newspapers by way of restriction. Any allusion to the proceedings of Parliament, or to the members of either house, was highly resented by Parliament at this time; and both Lords and Commons freely fined and committed indiscreet publishers. Another landmark in the history of journalism was the appearance in 1769 of the 'Letters of Junius' in the *Public Advertiser*.

The *Times*, founded in 1788 and controlled by John Walter who was the first publisher to use a steam press (1814), soon became, by virtue of its serious tone and the excellence of its home and foreign news services, the leading newspaper of England and Europe. It exerted a political power with which the government's ministers were forced to reckon. Other great English newspapers include the *Daily News*, of which for a time Charles Dickens was editor, the *Daily Telegraph*, the *Standard*, the *Globe* and the *Pall Mall Gazette*. The first halfpenny newspaper, the *Daily Mail*, appeared in 1896, and soon became an unprecedented success. The *Daily Mirror*, the first illustrated daily, appeared in 1903. Outside of London a number of great British newspapers, such as the *Manchester Guardian*, the *Newcastle Chronicle*, the *Sheffield Telegraph*, and the *Liverpool Courier*, are widely influential. *Punch* is the comic sheet of the British world. The *Graphic* and the *Illustrated London News* are famous for their illustrations. A notable tendency in British journalism following the Great War has been toward the amalgamation of leading newspapers into groups controlled by a single interest. The *Globe* was absorbed by the *Pall Mall Gazette*, which in turn was taken over by the *Evening Standard*. In 1922 the *Daily Mail* Trust was incorporated, controlling *The Daily Mirror* and *The Sunday Pictorial*, which in their turn control Associated Newspapers Ltd.

The first French daily, the *Journal de Paris* appeared in 1777. *Le Petit Journal*, of Paris, a one-cent paper devoted to news and petty gossip and *Le Petit Parisien* have a circulation of over one million copies. Among serious political and literary French newspapers the *Journal des Débats*, the *Temps*, the *Siècle*, and the *Presse* find prominent places, while

the *Figaro* is the organ of the fashionable world. *Excelsior* is a popular illustrated daily, established in 1910. Four daily papers are published in Paris in English: *The Daily Mail*; *The New York Herald*; *The Chicago Tribune*; and *The Evening Times*.

The *Allgemeine Zeitung*, established by Cotta in Augsburg in 1798, and still published, was the first real German newspaper; other important German newspapers are the *Neueste Nachrichten* of Munich, the *Frankfurter Zeitung*, the *Klonische Zeitung*, *Der Tag*, *Vorwärts*, *Borsen Zeitung*, and the *Hamburger Nachrichten*. The *Fliegende Blätter*, *Kladderadatsch*, and *Jugend* are comic sheets of immense circulation, the latter being noted for the excellence of its art work.

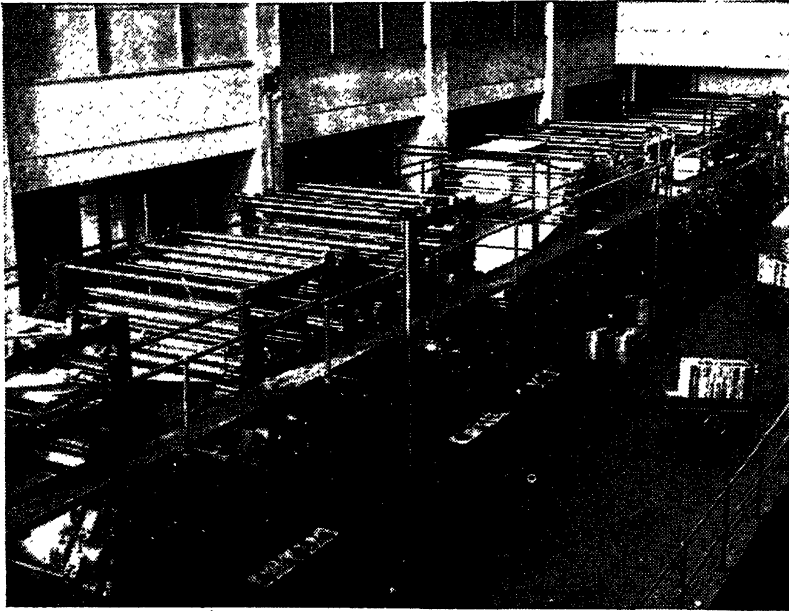
In Italy, until the rule of Mussolini, Italian papers were governed by a Royal decree of 1848, but in 1924 a decree was issued which forced the *Corriere della Sera* of Milan, long the most powerful paper in Italy, to a new proprietorship to conform to Fascist policy, and the *Stampa* of Turin and the *Matino* of Naples were brought under Fascist control.

In the United States, the first newspaper *Publick Occurrences, both Foreign and Domestic*, published in Boston by Benjamin Harrison, Sept. 25, 1690, was intended as a monthly publication, but was suppressed at once. The *Boston News Letter*, issued as a weekly first in 1704, lasted until 1776. In 1721 James Franklin, elder brother of Benjamin, established in Boston *The New England Courant*. In 1725 William Bradford began the publication of the *New York Gazette*, and three years later Benjamin Franklin established in Philadelphia the *Pennsylvania Gazette*. By 1754 there were four newspapers in Boston, two in New York, two in Philadelphia, and the *Virginia Gazette* at Williamsburg. In 1775 there were 37 newspapers printed in the colonies. All these were weeklies, with the exception of the *Advertiser* of Philadelphia, which was published semi-weekly. The first daily newspaper in the United States was the *Philadelphia Pennsylvania Packet*, afterward the *Daily Advertiser*, which was issued from 1784 until 1837. The *Commercial Advertiser* (later the *Globe*) of New York was founded in 1797, and the *Evening Post* in 1801. The *National Intelligencer* appeared in Washington in 1800.

The tremendous increase in the number and circulation of newspapers came with the introduction of the rotary power press and the growth of railways. In 1800 newspapers were still printed upon a hand press, the inking being done by small bags with which the

type was pounded. It required four hours' work to print 2,500 copies of the *Evening Post* in 1805. The price was five cents a copy, which was the usual price for daily newspapers at that time all over the country. The *Sun*, the first daily at one cent, a price made possible by the small size of the sheet, 10 inches square, and the possibility of issuing a large number by means of a rotary press with steam power, appeared in New York in 1833. It attained the unprecedented circulation of 60,000. In 1835 James Gordon Bennett established the *Herald*, also at one cent. It was

tion, edited by E. L. Godkin, which was henceforth to be a weekly edition of the *Post*. Of the group of three editors appointed by Villard at that time, Carl Schurz, Horace White, and Godkin, Carl Schurz soon resigned, and Godkin became its editor until 1900, ranking with Horace Greeley, Charles Gordon Bennett, and Charles Dana in that period when the policy of a paper was chiefly shaped by its editors. Meantime newspapers in other large cities were attaining importance. The Springfield (Mass.) *Republican*, the Boston *Journal* and the *Advertiser*, the Philadelphia



A Modern Newspaper Printing Press.

followed by the *Tribune*, founded by Horace Greeley in 1841, the *Times*, founded by Henry J. Raymond in 1850, and the *World*, afterwards edited by Manton Marble, in 1860. Sunday editions came into being through the call for news of battles in the Civil War. By 1868 they became common all over the country. Later came the *Journal* and the *American*, which, like the *World*, printed a number of editions daily. The *New York Evening Post*, founded 1801, had passed in 1829 under the editorial control of William Cullen Bryant, who then became also its chief owner and continued as its editor until his death in 1878. In 1881 it was acquired by Henry Villard who bought at the same time *The Na-*

*Ledger*, the *Detroit Free Press*, the *Chicago Tribune*, ranked with those of New York City in enterprise and circulation. Amalgamation of newspapers has gone on in the United States as well as in England. A departure in American journalism is the introduction of so-called 'tabloid newspapers,' papers printed on small sheets and consisting largely of pictures and news.

In 1800, when New York had three daily newspapers for a city of 60,000 inhabitants, steam, electricity, gas, railways, steamboats, water-mains, sewers, public schools, and uniformed policemen and firemen were unknown. The printing of several hundred thousand copies of a modern newspaper of from 8 to 40

pages in a few hours has been made possible only by astonishing improvements in the collection of news, the invention of the web power-press, stereotyping, type-setting machinery, and the making of paper from wood pulp. In 1800 the paper used for newspapers cost 23 cents a pound, while to-day it is less than one-fifth of that price. (See PRINTING, TYPESETTING MACHINES.)

The preparation of the 'copy' or material for a great newspaper requires a staff of men running into the hundreds. For the collection of general news throughout the country the newspaper agencies perform a service which would be impossible for any one newspaper. For local news every large city has press associations of its own and maintains its own correspondents in other large cities and in Washington, with a special corps of men who can be dispatched at an hour's notice to any part of the country. Upon a morning daily the great mass of 'copy,' telegraphic and local, should be edited and sent to the composing room by ten o'clock in the evening. After that come the important dispatches from Washington, the news of political meetings, and of local evening events. At one o'clock in the morning the last pages are made up and a few moments later the presses begin to revolve. Rapidity in typesetting has been more than doubled in the last twenty years by the use of the linotype and other typesetting machines. The latest type of press, operated by electricity, consumes 70 m. of paper per hour, and turns out 100,000 papers of 8 pages, pasted, folded, and counted. For the Sunday editions of the great city dailies, pictures, many of them in color, are now lavishly used, the photographic processes having reduced the cost of such work to one-tenth of what it would have been 40 years ago.

**Newt**, or *Eft* (*Triton*). a tailed amphibian, belonging to the same family as the salamander, but characterized by the strong compression of the tail, which is used as a swimming organ. The commonest of American species is *Diemyctilus virens*, about 4 inches long and greenish brown in color. Soon after maturity, when still small in size, it quits the water, goes into the woods, and becomes vermillion-red, with a row of bright dots along the sides. There it remains, growing continuously for two or even more years, when it returns to the water, resumes a green dress, and seeks a mate. About three weeks after hatching the lungs become functional. About the same time the animal adopts a carnivorous instead of a vegetarian diet. As the lungs become more

and more fully developed the gills diminish and finally disappear.

**New Testament**, that portion of the Bible which is made up of the Gospel according to Matthew, Mark, Luke and John; The Acts; the Pauline Epistles—to the Romans, Corinthians, Galatians, Ephesians, Philippians, Colossians, Thessalonians, Timothy, Titus, and Philemon; the Epistle to the Hebrews; the Epistle of James; the two Epistles of Peter; the Epistle of John; the Epistle of Jude; and the Revelation of John.

The language and text of the New Testament are discussed in this work under the heading BIBLE, as is also the New Testament Canon; while the different books are treated under their own names. The study of the New Testament—the origin of the writings, their authors, their dates, their historical setting, and their purpose—has given rise to a body of literature embodying the results of critical study of each book and of the New Testament Canon as a whole. See the separate books and BIBLE.

**New Thought**, the somewhat indefinite title under which are grouped many phases of belief in the power of the human will to control the physical body, the mental condition of one's self and others, and the conditions of one's environment, especially in a secular sense. It attacks disease and mental inhar-



Sir Isaac Newton.

mony by systematic compliance with certain acknowledged laws of health (selection of food, thorough mastication, open air exercises, etc.), conscious affirmation of freedom from inharmonious, and of ability to realize the desires (fame, wealth, success), through the power of the will as developed by auto-sugges-



tion to the conscious mind, and to the so-called 'sub-conscious mind' when in the hypnotic state of 'relaxation.' Consult Henry Wood's *The New Thought Simplified*, and Orison Swett Marden's *Peace, Power and Plenty*.

**Newton**, city, Massachusetts, Middlesex county, on the Charles River, is a residential suburb of Boston. It has an extensive park system, the Metropolitan Parkway bordering the Charles River for some distance. The Andover-Newton Theological Institution is situated here, as is also Lasell Seminary for Young Women. Newton was settled as part of Cambridge in 1631; p. 69, 873.

**Newton, Alfred** (1829-1907), English ornithologist. It was owing to his report on the bird life of Iceland, North America, and other regions that the British Association took steps (1868) to procure legislation for the protection of birds.

**Newton, Gilbert Stuart** (1794-1835), English portrait and genre painter, was born in Halifax, Nova Scotia. He was a pupil of his uncle, Gilbert Stuart. He imitated Watteau, producing small genre works. The Metropolitan Museum of New York has one of his pictures entitled *The Deserted* (1821). He painted portraits of Thomas Moore, Sir Walter Scott, and Washington Irving.

**Newton, Hubert Anson** (1830-96), American astronomer, was born in Sherburne, N. Y. His special research work was in geometry and in the mathematical problems in meteoric astronomy. By purely geometric reasoning he was able to show that a stream of meteors in 1866 was connected with a comet then visible. His investigations in this class of work gave him rank as one of the highest authorities on meteoric phenomena.

**Newton, Sir Isaac** (1642-1727), English natural philosopher, was born in Woolsthorpe, Lincolnshire. He entered Trinity College, Cambridge, in 1661, and applied himself to the study of mathematics. In 1665-7 he invented the binomial theorem, the method of tangents, and the fluxional calculus (direct and inverse). Late in 1665—if the tradition is authentic—the fall of an apple in the garden at Woolsthorpe started the train of thought which led him to the discovery of universal gravitation. He then deduced the rule of inverse squares from Kepler's third law, and attempted to verify it by the observed motion of the moon. The great work embodying his conclusions was published in July, 1687, with the title *Philoso-*

*phiæ Naturalis Principia Mathematica*. Newton's optical researches began in 1666, when he resolved white light into its constituent colors. Two years later he constructed the first reflecting telescope. Newton was made Lucasian professor of mathematics at Cambridge in 1669. The controversy between Newton and Leibniz regarding their respective claims to priority in the discovery of the differential calculus dragged on for a score of years from 1705. The facts elicited left no room for doubt of Newton's originality. This contest embittered seven years of his life. He died at Kensington, and was buried in Westminster Abbey.

**Newton, John** (1823-95), American military engineer, was born in Norfolk, Va. He was graduated at West Point in 1842, and was assigned to the corps of engineers. After a short interval of routine duty, he became an assistant professor of engineering at West Point (1843-4). He constructed the new batteries near Fort Hamilton, N. Y., and Fort Hancock, Sandy Hook, N. J., and was engineer in charge of the operations to remove the obstructions at Hell Gate, in the East River, New York. He retired from the army in 1886.

**Newton, Joseph Fort** (1878- ), preacher, was born in Decatur, Tex. Pastor of City Temple, London, 1916-19; St. James' Church, Philadelphia, since 1930. Among his works are *The New Preaching* (1930).

**Newton's Rings**, a phenomenon due to the interference of light, described by Sir Isaac Newton in 1675. When two glass surfaces—one plane, the other slightly convex—are pressed together, a series of tinted fringes are seen to surround concentrically the point of contact. When they arrive in opposite phases of vibration, there is destruction; when in similar phases, there is reinforcement of light—and these effects are produced at different distances from the center for the different colors. The measurement of the rings gives the wave lengths of prismatic light.

**New Year's Day**. As far back as 3000 B.C. the New Year festival, called Zakmuk, was celebrated by the ancient Babylonians. The Jewish Purim Feast, the Greek Festival of Cronos, the Roman Saturnalia, and the modern carnival have all had affinity with this Babylonian celebration. But the beginning of the year did not synchronize in each case. Whereas the vernal equinox marked the Babylonian New Year, and the autumnal equinox that of the Egyptians, Phoenicians, and Persians, the year of the Romans ended

at the winter solstice until Julius Cæsar changed the date to Jan. 1. The Jewish New Year occurs early in September; the Chinese, between Jan. 21 and Feb. 19. English custom has celebrated the New Year on December 25, March 25, and since 1752, January 1. The root idea appears to have been the revival of the sun's strength.

**New York** (the 'Empire State'), one of the Middle Atlantic States of the United States, and one of the original thirteen States. The State, exclusive of the islands along the Atlantic Coast, is roughly triangular in shape, and is bounded on the north and west by Lakes Erie and Ontario, the provinces of Ontario and Quebec, Canada, and by Pennsylvania; on the east by Lake Champlain, Vermont, Massachusetts, and Connecticut; and on the south by New Jersey and Pennsylvania. Included in the State are a number of islands, the most important of which are Manhattan Island, containing the main portion of New York City, at the mouth of the Hudson; and Long Island and Staten Island—the former between the Atlantic Ocean on the south and Long Island Sound on the north, the latter bounded mainly by New York Bay and Staten Island Sound. The surface of the State is characterized generally by high elevation and by a hilly or undulating contour. The Adirondack Mountains and neighboring ranges and plateaus occupy the major part of the region bounded by the St. Lawrence and Mohawk Rivers and by Lakes Champlain and George. The highest points in the State are found in the Adirondacks; among these may be mentioned Mount Marcy or Tahawas (5,344 ft.). The Highlands of the Hudson, with their wooded slopes and summits, and the rocky precipices which they present to view where the river breaks through them, are among the most striking scenic features of the State. Their best-known peaks are Breakneck (1,635 ft.), Storm King, Crow's Nest, and Anthony's Nose. See also HUDSON RIVER. The Catskills, a clump of mountains almost circular in shape, cover an area of about 500 square miles, and are characterized by beautiful wooded summits and deep glens and gorges. That portion of the State lying to the west of the Catskills is a plateau rising in at least two broad terraces, and a gradual slope from Lake Ontario, the higher portion having an average elevation exceeding 1,200 feet. The terrace levels are fertile plains, while the abrupt rises are the occasion of numerous waterfalls, such as those at different points along the Genesee

River, the precipitous Taughannock Falls, near Cayuga Lake, and the beautiful cascades of Watkins Glen, near Seneca Lake. New York is abundantly supplied with rivers. The Hudson, rising in the Adirondacks and flowing southward into New York Bay, is the most important commercial river waterway on the Atlantic Coast, being navigable for large steamboats as far as Troy—a distance of about 150 miles from its mouth. New York is a region of beautiful lakes. Part of Lake Erie and one-half of Lakes Ontario and Champlain belong to the State. Lake George, which discharges its waters into Lake Champlain, is noted for its scenery. In the Adirondack region are hundreds of lakes of all sizes, adding to the natural beauties of the landscape.

*Climate and Soil.*—The climate varies in different parts of the State, being much more equable and moderate at the coast and subject to greater extremes far inland. The surface soil is almost everywhere the sand and clay deposits of the Pleistocene glaciers. The State is almost entirely of Palæozoic and Archæan formations, almost every series from the Laurentian to the Upper Devonian being found. New York ranks high in the United States in the production of gypsum and in the quarrying of limestone. The principal mineral industry is the production of petroleum. Important is the mining of iron ore and production of pig iron; and production of coke from coal brought into the State. Salt is produced in large quantities from rock-salt mines and brine-wells. The Delaware Indians made salt from brine-springs in New York State and sold it to settlers as early as 1670, making probably the first commercial production of salt in the country, while the manufacture of salt by white people in the United States was begun near Syracuse about 1788. Recognizing the importance of forest conservation, the State legislature established in 1855 the Forest Preserve, comprising large areas in the two great forested sections, the Adirondack and Catskill Mountains. Since that time the State has extended the Forest Preserve. It is estimated that the value of the Forest Preserve now exceeds \$50,000,000. The principal trees in the Adirondack and Catskill regions are the pine, spruce, hemlock, balsam, tamarack, cedar, maple, and birch, as well as other deciduous trees.

*Industries.*—The fisheries of the State are largely carried on by the population along the southern coast of Long Island. The large agricultural interest of the State is dominated

by the great urban population, hence there is an enormous output of vegetables and dairy produce. The State has been greatly favored by its geographical position; its vast agricultural, lumber, and mineral resources; and to a considerable extent by the water power of the Mohawk, upper Hudson, Black, and Genesee Rivers, and Niagara Falls. A system of canals which connect Lake Ontario with the Erie Canal and Lake Champlain with the Hudson River form a network of inland waterways. By far the leading industry of the State is the making of men's and women's clothing. New York leads all the States in printing and publishing. The textile industries—comprising the manufacture of hosiery and knit goods, silk and silk goods, carpets and rugs, woolen, worsted, and felt goods, cotton goods, cordage and twine—considered as a unit, rank high among the manufacturing industries of the State. Slaughtering and meat packing, which includes wholesale establishments only, is another important industry in New York. The manufactures of New York represent a greater diversity of industry than any other State in the Union. New York City is not only the leading city and the commercial center of the United States, but also the industrial metropolis. This predominance in manufactures is closely connected with the abundant supply of labor—its large immigrant population being in particular an influential factor in causing manufacturing enterprises to locate there. New York City is the chief center of trade between the United States and Europe, and also one of the principal distributing points for domestic trade. Buffalo is the second city of importance in the State. Leading industries are slaughtering and meat packing, foundry and machine-shop products, flour-mill and grist-mill products, automobiles, soap. Also important are Rochester, with printing and publishing, and the manufacture of photographic apparatus and materials; Syracuse with many establishments, including motor vehicles, agricultural machinery, typewriters, foundry and machine-shop products, chemicals, furniture, cement, clothing and shoes. Schenectady is famed for electrical machinery, radio development, etc., and locomotives; Troy as a center of the collar and cuff industry; Utica for its textile manufactures, and Niagara Falls for hydro-electric developments and for food and chemical products.

**Commerce.**—New York easily ranks first among the States in both foreign and domestic commerce. It has a number of ports of entry,

among which are New York City, with its railroad, sea, and river terminals; Buffalo, Plattsburg (district, Champlain), Niagara Falls (district, Niagara), Ogdensburg (district, Oswegatchie), Oswego, and Rochester (district, Genesee).

**Population.**—According to the Sixteenth decennial Census, held from April 1, 1940, the population of the State was 13,479,142. The foreign-born numbered altogether 3,191,549, of whom 1,750,939 were naturalized. In 1940 there were 55 cities and 16 villages in the State with populations of 10,000 or more. New York, the largest city in the United States, had 7,454,995, an increase of 524,549 (7.6 per cent.) over its population in 1930. Buffalo, the second city, had 575,901 inhabitants—an increase of 2,825 (.05 per cent.) over 1930. Other cities of more than 100,000, in order of population, were Rochester, Syracuse, Yonkers, Albany, and Utica. In the population group between 50,000 and 100,000 stood six cities—Schenectady, Binghamton, Niagara Falls, Troy, Mt. Vernon, New Rochelle.

**Education.**—Though free elementary schools existed in New York during the early Dutch period, in 1811 the common school system was permanently established. In 1812 the State Department of Public Instruction was organized, with a State superintendent having supervision of the schools below collegiate and academic grades. The powers of the State university were eventually extended to include the supervision of professional, scientific, and technical schools. By the Unification Act of 1904 the Board of Regents of the State university was given general supervision and control of elementary, secondary, and higher education. Among the institutions of higher learning in New York are the following: Cornell University, at Ithaca; Columbia University, at New York City; Colgate University, at Hamilton; Hobart College, at Geneva; Hamilton College, at Clinton; Union University, at Schenectady; New York University, at New York City; College of the City of New York; University of Rochester, at Rochester; Syracuse University, at Syracuse; University of Buffalo, at Buffalo; Elmira College, at Elmira; Fordham University, at New York City; College of St. Francis Xavier, at Brooklyn; Alfred University, at Alfred; Niagara University, at Niagara Falls; St. Lawrence University, at Canton; Russell Sage College of Practical Arts, at Troy. Among colleges for women are Barnard, at New York City, and Vassar, at Poughkeepsie. The United States Military Academy is at West Point.

*Charities and corrections.*—There are three State boards appointed by the governor and senate, and having supervision respectively of charities, lunacy, and corrections. The Department of Social Welfare superintends 1,004 institutions. The House of Refuge on Randall's Island is among private institutions receiving State support.

The Department of Mental Hygiene supervises 14 State hospitals for the insane, many schools for defectives, and Craig Colony for Epileptics.

The State Department of Correction has supervision of Auburn Prison, at Auburn; Clinton Prison, at Dannemora; Sing Sing Prison, at Ossining; Great Meadow Prison, at Comstock, and reformatories. The Elmira Reformatory is one of the best known in the country.

*State Parks.*—New York State maintains an elaborate system of parks. Some of the up-state parks are: Allegany State Park, 1 m. from Salamanca; Battle Island Park, 2 m. from Fulton; Chenango Valley State Park, 11 m. from Binghamton; Chittenango Falls State Park, 3 m. from Cazenovia, 20 m. from Syracuse; Clark Reservation, 3 m. from Syracuse; Finger Lakes State Parks, 9 in number, are located about the Finger Lakes in central New York; Gilbert Lakes State Park, 12 m. from Oneonta; Green Lakes State Park, 2 m. from Fayetteville, 9 m. from Syracuse; John Boyd Thacher Park, 15 m. from Albany; Letchworth State Park, 29 m. n.w. of Hornell; Niagara State Parks, several in number at Niagara Falls; Selkirk Shores State Park, 22 m. from Oswego; Taconic State Park; Adirondack Forest Preserve; Thousand Islands State Parks; and a number of smaller parks. In addition the Saratoga Springs Reservation is under state jurisdiction.

There are 16 state parks on Long Island the largest being Jones Beach; 9 in Westchester co., the largest being Poundridge Reservation, 4,100 acres; and a number of Parkways. The Bronx River Parkway extends from the Botanical Gardens to Kensico Dam at Valhalla; the Bronx River Parkway Extension, from Kensico Dam to the Bear Mountain Bridge is patrolled by State troopers.

The Palisades Interstate Park has 47,000 acres, a river frontage of 22 m., and extends from Fort Lee, N. J., to Cornwall-on-the-Hudson. It has a depth of 20 m. back from the river. Palisades I. P. receives some 10,000,000 visitors annually; the Bear Mountain Park, a section of the Palisades I. P., has

fine winter sport facilities and camps for summer. The Catskill Park, situate in the valleys of the Hudson, Mohawk and Delaware Rivers, embraces over 230,000 acres of State owned land, within which are a number of campsites for use of the general public. This park is reached by several of the fine State highways.

*Government.*—The present constitution was adopted in 1894. Proposed amendments must be approved by a majority of each house in two successive legislatures, and then by a majority of the votes cast at a popular election. Beginning with the year 1916 the question of revising the constitution must be submitted to popular vote once every 20 years. The legislature consists of a Senate, and of an Assembly, both houses are elected biennially. Regular sessions convene annually, in January, and are not limited in length. The lieutenant-governor is the presiding officer of the Senate. Any bill may originate in either house. The chief executive officers are the Governor, Lieutenant-Governor, Comptroller, Attorney General and Secretary to the Governor, all elected for four year terms.

Under the Reapportionment Act New York has 45 Representatives in the National Congress. New York being the most populous State in the union, has eleven more Congressional Representatives than the next ranking State in population. Albany is the State capital. The judicial authority is vested in a Court of Appeals, consisting of a chief judge and six associate judges, elected for 14 years; in a Supreme Court of about 100 justices, elected for 14 years in 9 judicial districts, though each judge has jurisdiction throughout the State; in four Appellate Divisions of the Supreme Court—one for each of the four judicial departments into which the State is divided; in County, Surrogates', and City Courts; and in Justices of the Peace and Police Justices. There is a State Board of Claims, appointed by the governor and senate. New York City has its own judiciary system.

*History.*—A number of Spanish, French, and Portuguese explorers are supposed to have visited the mouth of the Hudson during the 16th century, but it remained for Henry Hudson to rediscover the river in 1609, and establish the Dutch claim to ownership. Six weeks before this visit, Champlain had come down from Canada into the northern part of the State and discovered the lake now bearing his name. The Dutch West India Company, char-

tered in 1621, was given practically full political and commercial power in the Dutch possessions in America.

The first effort at colonization was made by families of Walloons, sent out by the company, making settlements on Manhattan Island in 1623. The first colonists came under Captain Cornelius May. May was succeeded in 1625 by Verhulst, who gave place in 1626 to Peter Minuit. Minuit the same year bought Manhattan Island from the Indians for goods valued at 60 guilders, or \$24. Three Dutch governors, Wouter Van Twiller (1633-8), William Kieft (1638-47), and Peter Stuyvesant (1647-64), occupied the remainder of the period of Dutch rule. Under Stuyvesant, 'the last and the best of the Dutch governors', the colony prospered, the boundary between the English and Dutch colonies was settled, and the Swedish settlements on the Delaware were added to New Amsterdam.

In 1664 Charles II. of England sent Colonel Nicolls to take possession of the colony, and make good his grant of that region to his brother, the Duke of York. The garrison surrendered, Dutch rule came to an end, and New Netherland became New York, being ruled by governors sent out by the Duke. The boundaries of the province were not defined by the Dutch. The grant to the Duke of York (1664) included a part of Maine and the islands S. of it, and all the region between the Connecticut and Delaware Rivers. New Jersey was sold by the Duke in 1664, and Delaware in 1682. The portions of the Duke's grant included in Maine and adjacent islands were annexed to Massachusetts Bay in 1686 and 1691. That portion now included in Massachusetts and Connecticut was ceded by various agreements with those States, and the independence of Vermont was granted in 1790.

During the various intercolonial wars the colony suffered an undue share of violence, its frontier being pillaged by the French and the allied Indians. But the Iroquois, who long before had been angered by Champlain's aid to the Hurons, remained implacable enemies of the French and valuable defenders of the New York frontier. In 1690 Schenectady was taken by the French and Indians, and most of the 250 inhabitants either massacred or captured. A colonial congress met in 1690 for the purpose of making common cause with the Iroquois against New France. A second, the Albany Convention, convened at Albany in 1754 to 'confirm and establish the ancient friendship of the Five Nations,' and to consid-

er plans of permanent union among the colonies.

The Stamp Act Congress of 1765 met in New York City. Two years later the New York Assembly refused to vote supplies for the British troops, and was promptly suspended by the Crown, but gave way only when the first Provincial Congress met in 1775. In 1776 the British fleet took possession of New York, which was retained as a base of operations throughout the war. New York was slow in joining the Union, being the 11th State to ratify the Constitution. This reluctance called out those writings of Hamilton, Madison, and Jay known as *The Federalist*.

The organization of the State government began with the meeting of a popular convention at White Plains in 1776. The first State constitution, adopted in 1777, remained in force 45 years. The fourth and present constitution dates from 1894. At the beginning of the Civil War, New York had many Southern sympathizers and the mass of her people were believers in States' Rights, but when hostilities actually broke out New York rallied to the defence of the Union. Nevertheless in 1863 occurred in New York City what are called the 'Draft Riots,' occasioned by the drafting of citizens for military service, and Horatio Seymour, the Democratic governor, elected in 1862, was strong in his denunciations of the war and its leaders.

The Tammany Society, organized in New York City in 1789 as a social and patriotic body, became identified with the Democratic-Republican Party in 1798; and it has since exerted great influence in the politics of New York State as well as New York City (see TAMMANY HALL). From 1869 to 1871, however, it came into marked disrepute on account of the so-called 'Tweed Ring.' Another Democratic ring that flourished in the State from 1820 to 1850 was known as the 'Albany Regency.' The year 1879 was marked by the first legislative meeting in the new State Capital at Albany.

In 1903, at a popular referendum, the sum of \$101,000,000 was voted for the purpose of rebuilding the Erie Canal. See NEW YORK STATE BARGE CANAL. In 1907 the Public Utilities Act was passed, creating two public service commissions. State legislation in recent years has dealt chiefly with economic and social questions. Factory acts and other labor legislation have been passed; the educational and charitable and penal systems have been reor-

ganized, and their work extended; and the tax system has been overhauled.

The criminal law was made more severe in 1926. The minimum prison term for burglary was raised from 10 to 15 years, and the Baumes Law made life imprisonment obligatory on persons convicted of a fourth felonious offence. Important recent measures include creation of a Board of Milk Control to regulate distribution and prices; establishment of a minimum wage system; a bond issue for unemployment relief. The Saratoga Springs Authority was created as a body financially supported. It is a commission for the development of the Reservation and medical treatment at the Springs.

On Dec. 11, 1930, the Bank of United States, with 61 branches in New York City, was closed, the largest suspension of the kind in American history. The Governor's term having been lengthened, 1937, Governor Lehman was elected, for the fourth time, 1938, for a four-year term. Jan. 1, 1943, Thomas E. Dewey (R) was inaugurated as governor of the state for a four-year term.

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**New York**, chief city of the State of New York, the metropolis of the United States, the largest city in the Western Hemisphere, and the second city in the world in point of population. The City Hall is in the lower part of Manhattan Island. The original city

comprised part of a narrow tongue of land at the mouth of the Hudson River, known as Manhattan Island, with the Hudson River on the w., and the East and Harlem Rivers on the e., and extending northward to Spuyten Duyvil Creek. In 1874 and in 1895 parts of Westchester county were incorporated within the city limits. In 1896, through an act of the State legislature, Greater New York was created by the consolidation of Brooklyn, Long Island City, Staten Island, Westchester, Flushing, Newtown, Jamaica, and parts of Eastchester, Pelham, and Hempstead with New York City. By the charter of 1898 this large territory was divided into five boroughs, as follows: Manhattan (22 sq. miles), Brooklyn (78 sq. miles), Bronx (42 sq. miles), Queens (130 sq. miles), and Richmond (57 sq. miles).

Manhattan Borough comprises the former city of New York; Bronx Borough is the district n. of Manhattan, between the Harlem River and Westchester; Brooklyn Borough contains the former city of that name, southward to and including Coney Island; Queens Borough contains Long Island City, College Point, Flushing, Jamaica, and Rockaway Beach; Richmond Borough comprises the whole of Staten Island. The total water front is about 340 miles. The climate of New York City is healthful, but subject to sudden temperature changes. The harbor of New York, which is known as Upper New York Bay, comprises about 15 sq. miles, and is one of the finest in the world, while the long shore line of Manhattan, e. and w., offers docking accommodation for deep-sea ships adjacent to the business heart of the city. The Upper Bay communicates with the Lower Bay, which is partly shut off from the sea by the tongue of Sandy Hook, through a strait called the Narrows, where the shores of Long and Staten Islands approach to within a mile and a quarter of each other, the heights on either side being lined with forts. On the Brooklyn side are Fort Lafayette and Fort Hamilton, and opposite are Fort Tompkins and Fort Wadsworth. Another connection between the Upper and Lower Bays is afforded by Staten Island Sound. The Brooklyn shore from Bay Ridge to Long Island City, a distance of 10 miles, is lined with docks and includes the Brooklyn Navy Yard.

The most famous object in the Upper Bay is the Bartholdi statue of *Liberty Enlightening the World*, on the site of an old fort on Bedloe's Island. The statue, a colossal bronze

female figure holding aloft a torch, which is lighted at night by electricity, stands upon a pedestal rising 150 ft. from the ground, and is itself 151 ft. in height. The Borough of Manhattan (Manhattan Island) comprises in its 22 sq. miles many of the greatest office buildings in the world, and the largest banks, churches, museums, libraries, shops, residences, and tenements in America. The part of the island below Houston Street, extending about two miles from the Battery, is laid out with irregular streets, Broadway constituting its chief artery. North of Houston



*Statue of Liberty.*

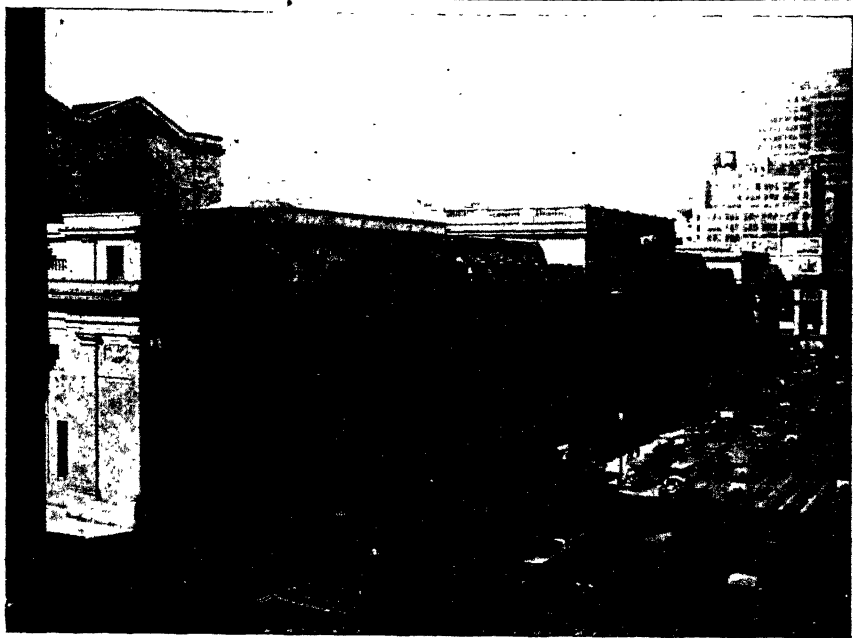
Street the streets run e. and w. from river to river, intersected by avenues running n. and s. The streets are numbered from one upward and are 260 ft. apart. The avenues, partly known by numbers, but also by letters and names, are from 500 to 1,000 ft. apart. Broadway takes an almost diagonal course throughout the length of the island.

The lower triangular end of the island, extending from the Battery on the s. to the vicinity of the City Hall on the n., and bounded by the Hudson River on the w. and the East River on the e., comprises the banking and exchange district, with Wall and Broad Streets and Broadway as thorough-

fares. Extending westward from Broadway, from the vicinity of the City Hall to that of Union Square, is the wholesale dry goods section of the city. On the east side, with the famous Bowery as a main artery, are miles of tenement houses, where live and toil hundreds of thousands of Russian and Polish Jews, Italians, Hungarians, Bohemians, and other immigrants. The Chinese quarter centers in Mott Street from Bayard to Chatham Square. Numerous social settlements, clubs, churches, etc., minister to the wants of the working classes in this part of the city. Recreational opportunities are provided by numerous public and private institutions, including public comfort stations, free floating baths, vacation playgrounds, and recreation piers.

Along Broadway from Tenth to Thirty-fourth Streets are the wholesale clothiers and dealers in cloaks and women's wear. Above Thirty-fourth Street hotels, theatres, and stores fill Broadway as far as Central Park (Fifty-ninth Street); while Fifth Avenue below Fifty-ninth Street, once the home of the wealthy classes, is now given up in its lower part to office buildings and from Madison Square to Fifty-ninth Street contains many important hotels, men's clubs, department stores, and jewelry, art, millinery, and other specialty shops. Fronting the block from Thirty-third to Thirty-fourth Streets, stands the gigantic Empire State Building, opened May 1, 1931, then the highest man-made structure in the world, surmounted with a mooring-mast intended for dirigibles. The magnificent New York Library is also in this section, covering the block from Fortieth to Forty-second Streets. The west side of the city below Central Park is filled with manufacturing establishments and warehouses for a mile from the water front. In this region a vast amount of industry is carried on, almost every conceivable type of human activity being represented excepting agriculture. All along the east side is a continuation of the tenement district.

For a distance of  $2\frac{1}{2}$  miles, from Fifty-ninth to 110th Street, Central Park divides the city into two parts. On the e. are the homes of the wealthy, along Fifth, Park and Madison Avenues; farther e., toward the river, generally speaking, are the tenements of the poorer people, though there has been a tendency recently toward renovation of this section. At Sutton Place, e. of Second Avenue, are many new homes and apartments. West of the park are miles of costly apart-



*Photos from Ewing Galloway, N. Y.*

*Upper, Pennsylvania Station. Lower, Grand Central Terminal.*



ment houses, and n. of it extend the sections known as Harlem and Washington Heights. The former is the home of the city's large Negro population. Above the Harlem River is the Bronx Borough where reside thousands who do business in lower Manhattan. Along the Hudson River, from 72nd Street, extends Riverside Drive, one of the most beautiful promenades in America.

**Parks**—In the lower part of Manhattan are a number of small parks, among which are Battery Park (21 acres) at the tip of the island, containing the Aquarium—old Castle Garden, scene of Jenny Lind's triumphs—the Walloon Monument, a bronze statue of John Ericsson, the Verrazano monument, and a memorial shaft to wireless operators who died at sea in the performance of their duty; Bowling Green, a small triangle, the oldest park in the city, containing a statue of Abraham de Peyster; City Hall Park (8¼ acres), containing City Hall and a statue of Nathan Hale; Gramercy Park, belonging to the owners of the surrounding property and containing a bronze statue of Edwin Booth; Stuyvesant Square, filled with fine old trees; Union Square (3½ acres), with imposing statues of Washington, Lincoln and Lafayette; Washington Square (8½ acres), at the southern end of Fifth Avenue, with the Centennial Arch designed by Stanford White and costing over \$160,000, at its northern entrance; and containing statues of Alexander Holley and Garibaldi; Madison Square with its statues of Roscoe Conkling, President Arthur, W. H. Seward, Admiral Farragut and the Eternal Light, an electric star, memorial to the city's World War dead; and Bryant Park, occupying the square behind the Public Library, with statues of William Cullen Bryant, Washington Irving and Dr. James Marion Sims.

In the heart of the city from 59th Street to 110th Street, between Fifth Avenue and Central Park West, lies Central Park, with 862 acres of beautiful wooded spaces, lawns, lakes and thoroughfares. It contains a menagerie, the Metropolitan Art Museum, an Egyptian obelisk known as Cleopatra's Needle, the Maine Memorial, and statues and busts. Riverside Park, lying between Riverside Drive and the Hudson, is bordered by many fine residences and is the site of the Soldiers and Sailors' Monument, an equestrian statue of Joan of Arc, statues of Louis Kosuth and Samuel J. Tilden, and the fine tomb of General U. S. Grant. The New York Zoological Park and New York Botanical

Garden are in Bronx Park with areas making a total of 719.12 acres. Magnificent parkways connect Bronx Park with Van Cortlandt Park (1,132 acres), which contains large forests, lakes, facilities for golf and other sports, and Pelham Bay Park (1,756 acres with similar facilities for sports), which extends for seven miles along Long Island Sound. Other parks are Morningside (31¼ acres), Mount Morris (20 acres), Poe Park, High Bridge Park (126 acres), and Inwood Hill Park of historic and scenic interest (166 acres), extending n. from Dyckman Street along the Hudson River to Spuyten Duyvil Creek. Prospect Park, Borough of Brooklyn (526 acres), is one of the city's finest parks.

A large number of the people who do business in Manhattan live far away from their shops and offices. Every morning this army of workers gathers from the dwelling districts in Manhattan, from Bronx, from Brooklyn, Staten Island, Long Island, and from New Jersey and Connecticut. The transportation facilities, especially for the throngs traveling up and down the length of Manhattan Island are still inadequate, notwithstanding the constant improvement of elevated, subway and bus lines. The first street horse-car line was opened along Fourth Avenue in 1832. In 1870 the first elevated road, on which steam locomotives were used, ran from the Battery to 59th Street. Eight years later the Sixth Avenue elevated line was extended to Harlem, and parallel lines were built on Second and Third Avenues. The first important surface cable line was run along Third Avenue in 1891, electricity later taking the place of steam locomotives upon the elevated roads and the cable in the streets.

**Subways**.—With the growth of population and the constant widening of the gap between the homes and business places of the people, the conditions of crowding, discomfort, and danger in local transportation grew such that in 1900 a contract was awarded by the city for the construction of a subway railway system, beginning at the City Hall and running northward with an elevated extension into the Bronx to Bronx Park. A new dual subway system, built jointly by the Interborough Rapid Transit Company and the city on the one part, and by the Brooklyn Rapid Transit Company and the city on the other part, was started in 1913 and opened for operation in 1918. In 1932 the Interborough Rapid Transit Subway had two important

systems: the Lexington Avenue line on the east side and the Seventh Avenue line on the west side of Manhattan Island, both running n. and s. the entire length of Manhattan, extending into Brooklyn and into the Bronx, with terminals at Flatbush Avenue, Brooklyn, at 242nd Street, Manhattan and at Pelham Bay Park, and it has cross connections in Manhattan, Brooklyn and Queens. A second subway system is the Brooklyn-Manhattan Transit lines, which by diverse routes connect Brooklyn and Queens to Manhattan by bridge and tunnel.

In 1932 a third subway system, the Independent Subway, was opened. This travels greater distances, with fewer stops, at high speed and is modern in its effort to provide space and comfort for passengers. Five new tunnels are included in the plans of this system. Traffic lights on surface streets on a 'progress system,' to provide continuous vehicular movement at a certain speed, proved successful in 1932 and warranted the expansion of the system.

**Railroads.**—Most of the important railroads in the United States serve New York either by track or by coastwise steamer service from some other port. Of these roads only the Pennsylvania at 33rd Street and the New York Central have passenger stations of their own in Manhattan. Some of the greatest railroads use these, other railroads send their passengers by ferries or tube trains from terminals on the New Jersey side of the Hudson River.

**Airways.**—Many lines of air service are operated from New York. Floyd Bennett Field on Barren Island in Jamaica Bay, built by the city, has a landing place for seaplanes. Newark Metropolitan Airport accommodates a number of important air transport lines. Curtiss Valley Stream Airport, at Valley Stream, L. I.; Essex Field, at Caldwell, New Jersey; North Beach Seaplane Base, at Bowery Bay, L. I.; Roosevelt Field, at Garden City, L. I., and Teterboro Field, at Hasbrouck Heights, New Jersey, are the most important landing fields which serve New York flyers.

**Steamship Lines.**—Both passengers and shippers of freight can find here, practically at all times, vessels about to sail for any section of the world. It is estimated that four out of five travelers going abroad embark at New York City.

**Bridges.**—The first serious effort to accommodate the enormous passenger traffic be-

tween Brooklyn and New York dates from 1870, when the Brooklyn suspension bridge, opened to the public in 1883, was begun. It extends from Park Row, Manhattan, to Sands and Washington Streets, Brooklyn. Its towers reach 272 ft. above high water. During succeeding years the rapid growth of the city pressed so closely upon all the facilities of transportation that further bridge building became a recognized necessity. See **BRIDGES**. Bridges crossing the Harlem River are Washington Bridge and High Bridge, a stone structure which carries part of the old Croton Aqueduct. The George Washington Memorial Bridge, completed in 1931 (cost about \$60,000,000), extends from 178th Street, Manhattan, to Fort Lee, New Jersey. The Triborough Bridge, completed 1936, cost \$48,000,000 and connects Queens, Manhattan and Bronx. The Wrightstone Bridge from the Bronx to Long Island was opened in 1939.

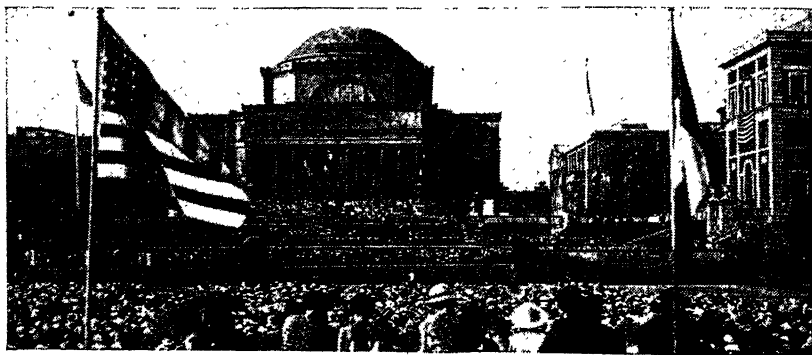
**Tunnels.**—Tunnel construction has largely supplemented the ferry system for passenger communication with Long Island and New Jersey. By means of tubes, the Pennsylvania Railroad is enabled to bring its trains from the South and West into the heart of New York. From the Pennsylvania Station two crosstown tunnels run e. under 32nd and 33rd Streets to First Avenue, and continue under the East River to Long Island City, where connection is made with the Long Island Railroad. The tunnels of the New York Central Railroad include the Park Avenue Tunnel (opened in 1837) from Grand Central Station at 45th Street to 96th Street, and St. Mary's Tunnel under St. Mary's Park, Bronx (opened in 1904). The Interborough Rapid Transit Tunnel System includes the following tubes under the East River: A tunnel from the Battery, New York, to Joralemon Street, Brooklyn (opened in 1908); the Clark Street Tubes from Interborough Seventh Avenue Subway in lower Manhattan under the East River to Brooklyn (opened in 1919); Belmont Tunnel from 42nd Street, Manhattan, to Long Island City (opened in 1915); and two Harlem River tunnels, one for the Lenox Avenue Line (opened in 1905), and one for the Lexington Avenue Line (opened in 1918). In 1929, the Independent Subway opened a tunnel from Fulton Street, Manhattan, to Cranberry Street, Brooklyn. In 1927 the Holland Vehicular Tunnel was opened under the Hudson River from Manhattan to Jersey City. The Lincoln Tunnel to Weehawken,

son Tower Building (48 stories), at Seventh Avenue and 34th Street; Navarre Mercantile (44 stories), at Seventh Avenue and 38th Street; Hotel New Yorker (43 stories), at Eighth Avenue and 34th Street. In the fourth skyscraper region are the Fuller Building (42 stories), at 57th Street and Madison Avenue, the Waldorf-Astoria Hotel (47 stories), at Park Avenue and 50th Street, Ritz Tower (42 stories), at Park Avenue and 57th Street, and 444 Madison Avenue (43 stories), at 50th Street.

Wall Street (so-called because of the wall from river to river which once stood here as

Row between Duane Street and Tryon Row, spanning Chambers Street with a great archway and extending to Centre Street. This immense building of 24 stories has 700,297 sq. ft. available floor space—an area of about 16 acres.

West of where Broadway turns at 11th Street, is Washington Square, long the home of the conservative, and with handsome old houses now mostly being transformed into apartments and studios, w. of this section lies the region 'Greenwich Village'. The Washington Arch, erected of white marble in 1892, stands at the entrance to Fifth Avenue.



*Seth Low Library, Columbia University.*

protection for the little town of New Amsterdam) runs from Broadway to the East River, and contains the Sub-treasury, a massive granite pile on the site of the former City Hall, where Washington took oath as first President of the United States. In the buildings that line Wall Street from end to end are the greatest banks in the country and the offices of hosts of stock brokers, bankers and lawyers.

On Liberty Street, near Broadway, is the Chamber of Commerce, on Nassau Street the home of the Mutual Life Insurance Company, and farther w., on Church Street, from Cortlandt to Fulton, are the twin Hudson Terminal Buildings from beneath which run the Hudson tubes. On Centre, Lafayette and Franklin Streets stands 'The Tombs,' the City Prison, connected with the Criminal Court Building by a bridge (the 'Bridge of Sighs'). City Hall Park extends from Chambers to Mail Streets and from Park Row to Broadway. It contains City Hall, County Court House and City Court House. There is a new Federal Court House above Foley Square.

The Municipal Building is located on Park

East, on the river, is Bellevue Hospital, at 26th Street; and at 65th Street and Avenue A the buildings of the Rockefeller Institute for Medical Research.

Surrounding Madison Square are some notable structures. On the n.e. stood until 1925 the famous old Madison Square Garden. At the s.w. is the Flatiron Building, said to be the world's first steel skyscraper. On the e. is the Metropolitan Life Insurance building, with its magnificent clock tower, 700 ft. high. Broadway and 42nd Street (Times Square) is the center of the theatrical district. At 42nd Street and Broadway is the *Times* Building, 28 stories high.

In the vicinity of 59th Street, Fifth Avenue and Park Avenue, are grouped some of the most costly hotels in America, including the St. Regis, Gotham, Plaza, Savoy-Plaza and Sherry-Netherlands. Rockefeller Center, 'Radio City,' occupies three city blocks from 48th to 51st Streets between Fifth and Sixth Avenues. The RCA Building, mentioned above, contained at date of building the world's largest broadcasting studio. This city within a city is the biggest construction project ever undertaken by private capital. To

the w. of Radio City, on Eighth Avenue between 49th and 50th Streets is New Madison Square Garden.

Facing Central Park at 77th Street is the Museum of Natural History, while nearby is the New York Historical Society's Building. On the e. side of the Park, at Fifth Avenue and 82nd Street, is the Metropolitan Museum of Art. At 100th Street is the Mount Sinai Hospital, and at 103rd Street the New York Academy of Medicine.

On the East River, between 69th Street and 71st Street, is the New York Hospital—Cornell Medical Association, opened Sept. 1, 1932, occupying 11 buildings costing \$30,000,000. The Lying-in Hospital (now the Women's Hospital) and the Manhattan Maternity and Dispensary Hospital are a part of this medical center.

On the west side of the city, at 116th Street, are located the fine buildings of Columbia University, among them the \$1,000,000 Library—the gift of former President Seth Low—and St. Paul's Chapel. At the foot of the Library steps is the heroic figure *Alma Mater*, the work of Daniel C. French. West of the University grounds, and to the n., are the buildings of Barnard College, Teachers College, and the Horace Mann School for Girls.

The new Cathedral and St. Luke's Hospital are located on Cathedral Heights. Farther n., on Washington Heights, are the magnificent group of buildings of the College of the City of New York. See NEW YORK, COLLEGE OF THE CITY OF.

Riverside Drive is continued across the Harlem Valley by a magnificent viaduct, and runs along the river to Inwood, opposite which, on the heights across the Harlem River, are the buildings of New York University, with its domed Library and Hall of Fame, in which tablets to eminent Americans find a place. The colonial Jumel Mansion, built about 1765, is at 160th Street and Jumel Place. It was Washington's headquarters from September to October, 1776, and was purchased by the city in 1903; it is now a museum of Revolutionary relics.

At 168th Street, near the Washington Bridge, is the northern skyscraper group—the Columbia Medical department, (the College of Physicians and Surgeons) combining with the Presbyterian Hospital, Sloane Maternity Hospital, and Vanderbilt Clinic, to form the 'Medical Center.'

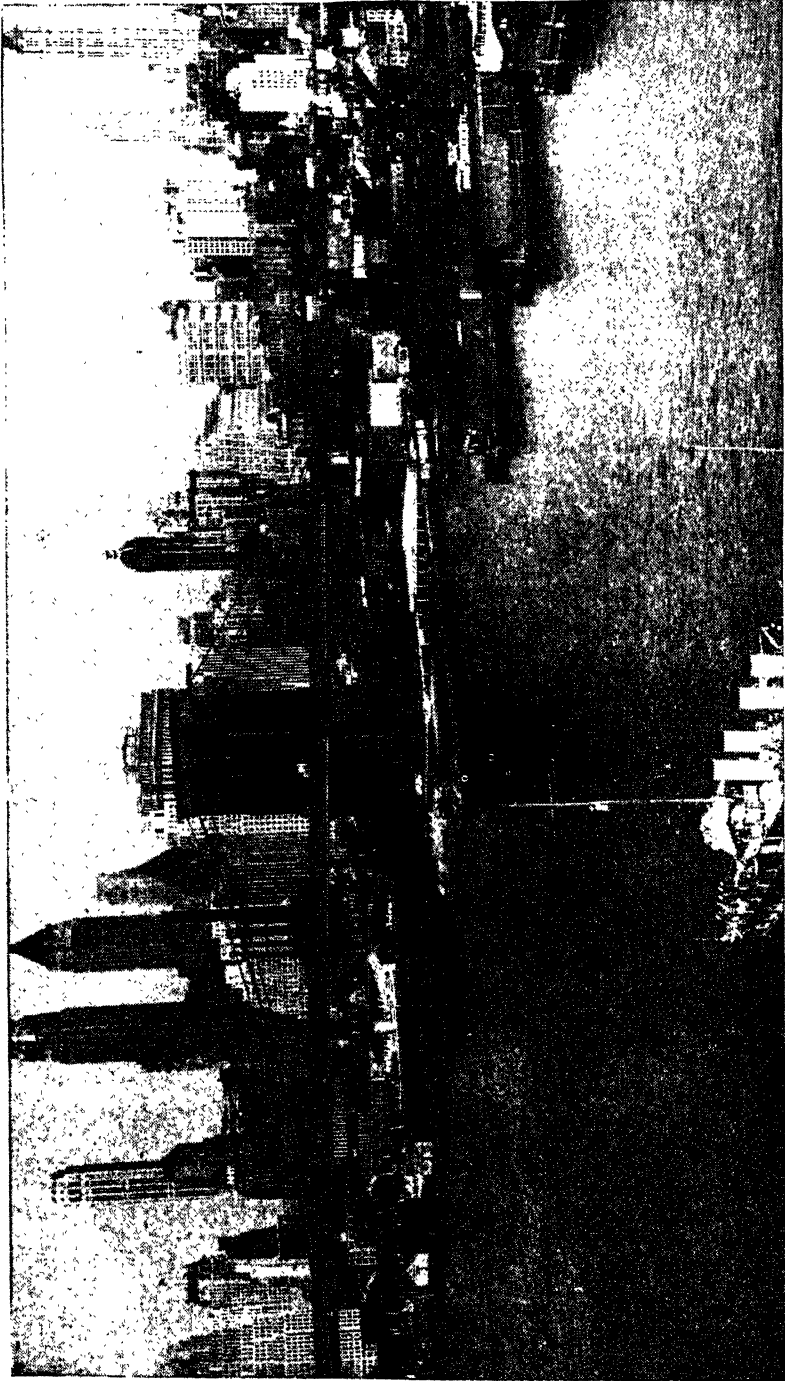
*Churches etc.*—Last census shows 2,809 churches, synagogues and other places of

worship in the five boroughs of New York, of which 1,044 are Jewish. The Cathedral of St. John the Divine stands on Cathedral Heights near 113th Street. Begun in 1885, it is the largest cathedral in the Western Hemisphere, surpassed only by St. Peter's at Rome, the Cathedral of Seville and the Duomo of Milan. In the heart of the business district near Wall Street stands, with its graveyard, Old Trinity. St. Bartholomew's, St. Thomas, and the Church of the Ascension have fine buildings; the Church of the Transfiguration, known as the 'Little Church Around the Corner' is on 29th Street. Riverside Church (formerly Park Ave. Baptist Church), at Riverside Drive and 122nd Street had in 1932 the world's largest carillon. There are about 430 church buildings of the Roman Catholic faith, with St. Patrick's Cathedral as the center. Of Jewish synagogues, the Temple Emanuel, at Fifth Avenue and 61st Street (in 1927 consolidated with Temple Beth-el), the third largest religious structure in New York City and the Shearith Israel (whose society dates back to 1675), at Central Park West and 70th Street, are noteworthy.

*Colleges and Seminaries.*—Columbia University, one of the oldest and best known institutions of learning in the United States, was founded in 1754 as King's College. Its first buildings were in Murray Street; in 1857 it moved to 49th Street and Madison; and in 1896 to Morningside Heights. Affiliated with the University are Barnard College, and the College of Physicians and Surgeons. The New York University has a number of fine buildings in the Bronx and on Washington Square. The City supports three institutions for higher learning: City College for men, Hunter College for women, and Brooklyn College. Fordham University (R. C.), on Third Avenue and 190th Street, and Manhattan College (R. C.) are also notable.

The Union Theological Seminary's home is on Morningside Heights; while the Protestant Episcopal Church has its General Theological Seminary in a beautiful group of buildings of the English university style at Twenty-first Street and Ninth Avenue. The Jewish Theological Seminary is on West 123d Street. Cooper Union offers free tuition to thousands of students. Among the medical colleges not mentioned above are the Cornell Medical College and University and Bellevue Hospital Medical College.

*Libraries and Museums.*—There are three public library corporations in the city: the New York Public Library; the Brooklyn

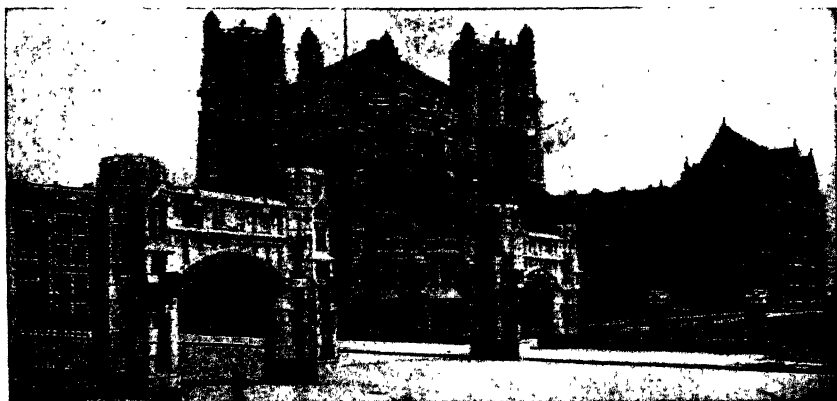


*New York City as seen from East River.*

Public Library; and the Queens Borough Public Library. In 1896 Andrew Carnegie offered the City \$5,200,000 for 50 library buildings, the City to furnish the sites and equipment. The New York Public Library has built many branches with its part of the gift; its main center is the great building at 42nd Street and Fifth Avenue.

Columbia University and Cooper Union also have libraries which are open to the public. There are also private collections opened to special students. The Metropolitan Museum of Art, situated in Central Park near 82nd Street, houses valuable collections of

*Hotels.*—When the Astor House in Lower Broadway was built, it could accommodate 400 guests, and there were but four other good hotels in the city. Today New York is a city of hotels whose accommodations are unexcelled. Among the largest are the following, with numbers of rooms: St. George, Brooklyn (2,632); the New Yorker, at Eight Avenue and 34th Street (2,500); the Pennsylvania, at Seventh Avenue and 32nd Street (2,200); the Waldorf-Astoria, at Park Avenue and 50th Street (2,200); the Taft, at 50th Street and Seventh Avenue (2,200); and the Commodore, at Lexington Avenue and



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*The College of the City of New York.*

Showing George Washington Arch.

paintings, sculpture, antiquities, porcelains, jades, armor, etc. The Cloisters (formerly George Grey Barnard Cloisters), on Washington Heights, houses the Museum's Mediæval art. The American Museum of Natural History on the w. side of Central Park is world famous for its exhibitions, researches and publications. The Aquarium contains a collection of aquatic animals and a special library.

*Theatres.*—Among the largest theatres are International Music Hall (6,200 seats), in Radio City, said to be the world's largest theatre; the Hippodrome (5,200 seats), the Metropolitan Opera House (3,366 seats), the Casino (3,000 seats); motion picture houses include the Capitol (5,400 seats), Paramount (4,000 seats), Roxy (4,000 seats), the new Roxy (3,700 seats), opened in 1932 in Radio City. Carnegie Hall (2,800 seats), built by Andrew Carnegie in 1891 at a cost of \$1,000,000 and rented at a nominal price, is used for concerts.

42nd Street (1,958). The McAlpin, the Barbizon-Plaza, at Sixth Avenue and Central Park South; Shelton, at Lexington Avenue and 49th Street; Savoy-Plaza, Biltmore, and Astor, are well known. Elaborate in decorations and appointments are the St. Regis and the Gotham at Fifth Avenue and 55th Street, the Ambassador on Park Avenue and 51st Street, the Plaza, Sherry-Netherlands, on Fifth Avenue near Central Park, the Ritz-Carlton, at Madison Avenue and 46th Street; the Vanderbilt at Park Avenue and 34th Street. The Martha Washington, Panhellenic House, the Rutledge and the Barbizon are for women only.

*Clubs.*—New York abounds in active clubs. The Union, at Fifth Avenue and 51st Street, is the oldest (1836). The Century Club, the Lotus, Chemists', Engineers', Pen and Brush, and National Arts Club have literary, artistic or scientific membership. Other notable clubs are the Cosmopolitan, Colony Knickerbocker, Lambs', Metropolitan, Na-

tional Democratic, Press, Racquet and Tennis and Republican. The Players' Club, in Gramercy Park, owes its building to the generosity of Edwin Booth. The Progress Club admits only Jewish members, and the University Club only college graduates.

**Newspapers.**—There are about 86 daily newspapers published in the Greater city. The oldest daily paper is the *Evening Post*, founded in 1801. The *Sun* was founded in 1833, the *Herald* in 1835 by James Gordon Bennett, the *Tribune* in 1841 by Horace Greeley; the *Times* in 1850 by Henry J. Raymond, and the *World* in 1860 by Manton Marble. The *Herald* and the *Tribune* combined in 1924 and the *Telegram* and the *World* in 1931 under the titles *Herald Tribune* and *World-Telegram*. These, with the *Journal of Commerce*, the *Journal-American*, *Brooklyn Daily Eagle*, the *Wall Street Journal*, *Brooklyn Times-Union* and *PM* are the most important daily newspapers. Some of them issue both morning and evening editions. Numerous others are in foreign languages. See NEWSPAPERS.

**Charities.**—The charities of New York City that are city-wide in scope, embrace some seven hundred various social agencies, which are placed in the following classifications: (1) municipal or tax-supported relief agencies which include the Board of Child Welfare, the Department of Public Welfare and the Volunteer Firemen's Benevolent Fund; (2) family service agencies such as the Charity Organization Society, the Society for Improving the Condition of the Poor, Catholic Charities, and the Jewish Social Service Association; and (3) relief societies, among them the Salvation Army, Volunteers of America and the Society of St. Vincent de Paul. Thousands of persons are drawn into a hand-to-mouth existence annually from all parts of the world; many of them come to New York to be cared for during the winter. The Municipal Lodging House, at 43 East 25th Street, with accommodations for about 800 in normal times, is maintained by the Department of Public Welfare. The Brace Memorial Newsboys' House assists more than 2,000 boys yearly. The Charity Organization Society and such settlements as Henry Street do invaluable work among the needy with the assistance of trained workers.

Many are sent to hospitals for needed care. These institutions include Bellevue Hospital, the oldest in the city (1816), with an ambulance service, the first of its kind, dating from

1869. Certain State hospitals or asylums for the insane are located within the city area for the benefit of the city population, including the Manhattan State Hospital, on Ward's Island. The leading general hospitals are the Presbyterian, St. Luke's, St. Vincent's, New York, Mount Sinai, Roosevelt, Flower and Fifth Avenue. The Rockefeller Institute for Medical Research is renowned for the results of its investigations and experiments.

Other private organizations are the Children's Aid Society (1853), with its schools, evening classes, and summer homes; the Association for Improving the Condition of the Poor (1843); the New York City Mission and Tract Society (1822); the New York Society for the Prevention of Cruelty to Children (1875); the New York Society for the Prevention of Cruelty to Animals (1875); the Society for the Suppression of Vice (1873); the Society for the Prevention of Crime (1877); and the Russell Sage foundation (1907), whose administrative charitable work within and beyond the city is supplemented by well directed investigation. The St. John's Guild maintains a hospital on Staten Island, and also floating hospitals for tuberculosis patients. The Seamen's Church Institute, occupying a twelve story building on South Street, is an institution which cares for over 50,000 seamen in the port of New York each year. It contains a chapel, hotel, bank, post office, employment bureau, public lyceum, and school for nautical instruction. Sailors Snug Harbor, on Staten Island, provides a home for aged and infirm seamen and is richly endowed. Charitable work on religious and denominational lines is represented by the United Hebrew Charities and by various technical schools, institutes, orphanages, homes, and other means of relief of the Jewish poor; also by the St. Vincent de Paul Society (Roman Catholic), the New York Catholic Protectory, and other institutions under Roman Catholic control. Instruction and relief for the blind are afforded by the New York Institution for the Blind (1831). There are three institutions for the deaf and dumb.

There are three famous New York Foundations: The Russell Sage, Carnegie, and Rockefeller. The first has for its purpose 'improvement of social and living conditions.' It undertakes particularly to provide surveys and statistics on social problems, through its library and *Social Work Year Book*, and distributes its funds to promote child welfare, city and regional planning, prevention of de-

linquency, etc. It halls are used by social service groups for conferences, etc. The Carnegie Foundation has for its purpose the encouragement of education and devotes its research and funds to allied problems. The Rockefeller Foundation aids public health, medical research, natural sciences, and the humanities, as well as economic and social science. Most New York institutions, as well as others all over the world, receive help from these.

**Public Education.**—The public schools of the city are under the direction of a Board of Education of 7 members, apportioned among the several boroughs. The City Superintendent of Schools and eight associates constitute the Board of Superintendents, which has large jurisdiction over the promotion and transfer of teachers, the selection of text books, and the determination of courses of study. The appointment of teachers is strictly by the merit system. Men and women teachers receive equal pay for the same grades; they may be retired on a half-pay pension after 35 years' service.

**Manufactures.**—New York is the leading industrial city of the United States, this pre-eminence in manufactures being attributable largely to the city's importance as a commercial, distributing and financial center, and to the abundant supply of immigrant labor. The leading industries in Manhattan are to a large extent the same as those of the city as a whole; in the four other boroughs bread and other bakery products lead all industries. Next to this product, clothing leads in Brooklyn; furniture in Queens; foundry and machine shop products in the Bronx; and ship and boat building in Richmond. The most important industries are women's clothing, printing and publishing, men's and boys' clothing, fur goods, bread and other bakery products, meat packing, perfumes, cosmetics and other toilet preparations, foundry and machine shop products, electrical machinery, apparatus and supplies, knit goods, furniture, boots and shoes other than rubber, coffee and spice, roasting and grinding, paints and varnishes, cigars and cigarettes, men's furnishings, jewelry, silk and rayon manufactures. Other manufactures are shirts, confectionery, boxes, motion pictures, not including projection in theatres, nonferrous-metal alloys and products, not including aluminum products, ship and boat building, structural and ornamental iron and steel work, gas and electric fixtures, lamps, lanterns and reflectors, canning and preserving, fancy

and miscellaneous articles, patent and proprietary medicines and compounds, lithographing, book binding and blank book making, ice cream, dressed furs, planing mill products, marble, granite, slate and other stone products.

**Commerce and Trade.**—The unequalled commercial advantages of New York City are largely based on the topography of the adjacent country, and on its location relative to the productive areas of the nearer west. The improvement of the original water route by the New York State Barge Canal, opened in 1918, served to strengthen New York's position as the great commercial port of the United States. However, of the Port's available water front scarcely one-half has been developed. Several harbor improvements have increased New York's commercial advantages. The Ambrose Channel entrance to the harbor was completed in 1914. The Port Authority of New York in 1932 completed the Union Inland Terminal Building at Eighth Avenue and 15th Street for the handling of all freight of less-than-carload lots. It combines warehouse, terminal, factory, office and loft space in one huge building. See NEW YORK AUTHORITY, PORT OF.

**Banks.**—New York City is the financial center of the country. The volume of bank clearings are best represented by the fact that the Clearing House transactions are about 65 per cent of the country's total clearings.

**Population.**—The growth of New York City has been by leaps and bounds. The population of Greater New York in 1910 was 4,766,883, in 1920, 5,620,048 and in 1940, 7,454,995, distributed as follows: Manhattan, 1,889,924; Bronx, 1,394,711; Brooklyn, 2,698,205; Queens, 1,297,634; Richmond, 174,441. The population increased more than 150 times in 150 years—an unprecedented growth. The city more than doubled its population between 1900 and 1930. The greatest density is in New York County, where there were 84,877.8 persons to the sq. m. in 1930. New York is remarkable for the cosmopolitan character of its population, 33.1 per cent of the people being foreign-born whites. The leading nationalities among them in 1930 were: Russians, 442,431; Italians, 440,250; Poles, 238,339; Germans, 237,588; Irish, 220,631; Austrians, 127,169; British, 118,441; Jews, 1,765,000.

In 1930 the native white population in New York City was 62 per cent of the total as against 61.7 per cent in 1920. The maximum density of population is in the district



adjacent to the n.e. edge of Central Park, where a great Italian and Spanish section has grown up and the density is 217,300 persons to the sq. m. Of the city's 23 assembly districts 14 have a density of more than 100,000 to the sq. m.

*Finance.*—Before 1873, the Common Council had the power of disbursement of the city's finances, although it was customary in the middle of the 19th century for the legislature to make the annual tax levy for the city. Following the remarkable period of the Tweed 'Ring' corruption (1867-72) a Board of Estimate and Apportionment, made up of the mayor, comptroller, and the city officials, was established. The general management of the finances and responsibility for the city's credit were lodged with the board. This plan proved so successful that it has been imitated in several American cities. Under the new city charter which was adopted on November 3, 1936, and became effective in 1937, the finances of the city are controlled by the Board of Estimate. The city treasurer collects the revenue and disburses the funds of the city. The comptroller is the officer of audit, he also administers the sinking funds and handles the management of city bond issues.

*Government.*—The first Greater New York charter went into effect in 1898 and followed much along the lines of the old city charter, but being found defective in various ways, it was amended in 1901 and again in 1905, when the mayor's term was made four years, and eligible for re-election. Further important modifications were effected by the Home Rule Enabling Act of 1924. On November 3, 1936, a new city charter was adopted which went into effect in 1937. Under this new charter the mayor, the comptroller and the president of the council are elected by city-wide vote for four year terms, and each of the five boroughs within the city elects a borough president, all for four year terms. The mayor, the comptroller, the president of council and the five borough presidents, of themselves, constitute the Board of Estimate. As members of the Board of Estimate and in the proceedings of that board, the mayor has 3 votes, the comptroller 3 votes, the president of council 3 votes, the presidents of Manhattan and Brooklyn boroughs have 2 votes each, and the presidents of Bronx, Queens and Richmond boroughs have 1 vote each. There is a City Council of 26 members elected within the boroughs by proportional representation. The number of coun-

cilmen will vary more or less with each reapportionment, which is to be made every two years. The City Council is the city's legislative body, but its acts, with some minor exceptions, must have the concurrence of the Board of Estimate, which is designed to be an administrative body. In certain cases the mayor has power to veto acts of the City Council. The city treasurer is appointed by the mayor. There is a Planning Commission composed of the chief engineer of the Board of Estimate and six members appointed by the mayor. Other bodies under the new charter are a Department of Public Works, a Department of Housing and Building, a Department of Law, a Department of Finance, headed by the city treasurer, and a Department of Investigation. There is also an assistant mayor. The mayor continues to be the chief magistrate of the whole city at large. The Planning Commission has to do with all matters of zoning, and also submits to the Board of Estimate the capital programs for the city for consideration by the Board of Estimate in making up the city's capital budget. The Department of Public Works has to do with plants and structures. The Department of Housing and Building has to do with buildings and tenement house matters. The Department of Investigation must be headed by a lawyer, and he is given discretionary authority to undertake any nature of investigation which he may deem to be in order for the public interest. The new charter specifies the certain conditions under which the city may issue corporate stock for water supply, rapid transit, docks, bridges and tunnels, and for the purchase of real estate. It also specifies conditions for the issuance of bonds, based on a policy of reducing long term indebtedness and proceeding more nearly according to a pay-as-you-go plan. The tax rate year is established by the City Council on or before June 25th of each year. The granting of franchises comes within the authority of the Board of Estimate, and no franchise is permitted to extend for a term longer than 25 years. In the 1937 municipal election Tammany lost control of the city council, but regained a majority in 1939. Fiorello La Guardia continued as mayor.

*Police, Fire and Health Departments.*—The Police Department is presided over by a Commissioner, appointed by and removable by the mayor, and with power to make and enforce the rules of the department. He is assisted by 9 deputies. The Commissioner

has power to appoint, remove after trial and promote members of the force, subject to the civil service rules and the appropriations made by the Board of Estimate and Apportionment and the Board of Aldermen. The duties of the uniformed force are patrol service and regulation of traffic. The department also renders service through the detective division, the bureaus of criminal identification and missing persons. The police force is composed of a chief inspector, and assistant inspector, 9 deputy chief inspectors, one commanding officer of the detective bureau, 28 inspectors, 27 deputy inspectors, 1 chief surgeon, 27 surgeons, 1 superintendent of buildings, 102 captains, 28 acting captains, 646 lieutenants, 1,068 sergeants, 16,915 patrolmen, 104 policewomen, 50 patrolwomen, 6 chaplains.

The Fire Department is under the control of a Commissioner appointable and removable by the mayor. He makes rules and regulations and appoints commissioners, heads of bureaus, and all officers and firemen. The department maintains a fire college for instruction in fire fighting, and an automobile school for training chauffeurs. The department includes a chief, 34 deputy chiefs, 96 battalion chiefs, one chief medical officer, 9 medical officers, 5 chaplains, 342 captains, 543 lieutenants, 73 engineers of steamer, 21 marine engineers, 24 pilots and 5,629 firemen. It consists of 221 engine companies, 125 hook and ladder companies, 10 fireboats and 4 rescue companies.

The Health Department is administered by a Commissioner, appointed and removable by the mayor. The department is headed by the Board of Health, which enacts the sanitary code, issues emergency health orders, and has broad powers in all matters affecting the public health. The work is carried on through eight bureaus: food and drugs, child hygiene, laboratories, nursing, preventable diseases, records, sanitation and health education.

**History.**—The first definite history of New York begins with the expedition of the English adventurer Hendrick Hudson, sent out from Holland in the *Half Moon* to discover a short route to India. He sailed into New York Bay on Sept. 3, 1609, and eight days later anchored off Manhattan Island. Hudson's report, on his return, of the abundance of valuable furs to be obtained in the new country stimulated Adriaen Block, commanding the Dutch *Tiger*, to sail for the island, where he arrived in 1613. The burning of his

vessel caused Block to build four small habitations, the first houses on Manhattan Island. He then built the *Restless* from the remains of the *Tiger*. In 1614 the States General of Holland chartered the United Netherlands Company of New Amsterdam, and gave it sovereignty over all the country between New France and Virginia. This company was succeeded in 1621 by the Dutch West India Company, which was invested with absolute power. In 1624 the *New Netherland*, commanded by Cornelius May, was sent out from Amsterdam with thirty families, of whom eight men remained on Manhattan Island, the rest of the party settling in the vicinity. One of these colonizers, William Verhulst, succeeded May as governor; and he, in turn, was followed by Peter Minuit, who had sailed from Amsterdam in December, 1625, with instructions to purchase the Indians' hunting ground. On May 6, 1626, he bought Manhattan Island for an assortment of beads and other trinkets valued at about 60 guilders, equivalent to \$24. In 1629 the Dutch West India Company brought about increased colonization by instituting the society of Patroons. Wouter Van Twiller succeeded Minuit in 1633 and during his administration (1633-8) there were many clashes between the Dutch and the English, who also laid claim to the territory from the Connecticut to the Delaware River. Van Twiller was succeeded by William Kieft. Stuyvesant's administration, 1647-64, was confronted with the disastrous results of Kieft's massacre, without cause, of 120 Algonquin Indians in 1643, and the resulting two years' war so reduced the settlement that the population fell to 800. In 1653, New Amsterdam was incorporated as a city, and a timber wall, or stockade, designed as a protection against the Indians and the English, was built along the present site of Wall Street.

Charles II. of England determined to conquer New Netherland and in March, 1664, granted that province to his brother James, Duke of York. On Sept. 8 of that year Col. Richard Nicholls with an English force landed at New Amsterdam, and Stuyvesant was compelled to surrender the city and colony. Upon taking possession, Colonel Nicholls, as agent for the Duke of York, renamed the city New York, and became its governor. The population was then about 1,500. In 1668 Francis Lovelace succeeded Nicholls, and during his rule the city prospered. In 1673 a Dutch squadron forced the surrender of the city to the Dutch government. The

colony was renamed New Orange, and military government was established; but a year later, by a treaty of peace, the English recovered possession, and retained it until after the Revolution.

Edmund Andros served as governor until 1681, when he was succeeded by Thomas Dongan (1681-8), under whom the first Provincial Assembly was convened (1683), and the first charter granted to the city (1686). From this charter dates the present system of docks owned by the municipality of New York. The Duke of York's accession to the throne of England in 1685, under the title of James II., caused the annulling of the charter, and the duchy of New York, with New England and New Jersey, was raised to a royal province. The loss of civil rights granted by the charter, the abolition of long-established boundaries, and the religious and political disturbances in England gave rise to a rebellion in New York City in 1689, headed by Jacob Leisler, who was executed in 1691, on a charge of treason.

The first printing press in New York City was set up by William Bradford in 1693, and in 1703 the first free school was opened. Slavery had existed for almost a century, and of the 6,000 inhabitants in 1712 nearly one-half were Negroes. In that year the Negroes, provoked by brutal treatment, rose up in rebellion; but the insurrection was cruelly repressed. About 1731 transportation to and from Boston was established by a monthly stage; and in 1756 a stage trip to Philadelphia was first undertaken. In 1765 the Stamp Act Convention met in New York. After the Battle of Lexington, a Committee of Public Safety assumed charge of the city; and in 1776 a considerable part of the American troops were quartered there. On Sept. 14, 1776, after the Battle of Long Island, the city was evacuated by the Continental soldiers, and was at once occupied by the British, who held it until after the treaty of peace. The British finally departed on Nov. 25, 1783.

From 1785 to 1790 New York City was the national capital. Congress met in the old City Hall, on the site of the present Sub-Treasury building at Wall and Nassau Streets; and it was there that Washington was inaugurated President on April 30, 1789. The city was also the State capital until 1797, when Albany was chosen. In 1789 was founded the Society of St. Tammany, the progenitor of the present Tammany Hall. The successful trip of the steamboat *Cler-*

*mont*, constructed by Robert Fulton, which began to ply regularly between New York and Albany in 1807, inaugurated an era of commercial development and prosperity. In 1819 the steamer *Savannah* made her first trip from New York across the Atlantic Ocean. The opening of the Erie Canal in 1825 gave a vast impetus to New York's commercial growth. Epidemics of cholera in 1832 and 1834 caused great loss of life and in 1835 a fire destroyed \$10,000,000 worth of property in the business district. The financial panic of 1837, during President Jackson's administration, was also severely felt in New York. In 1869 an attempt to corner gold precipitated a panic which culminated in 'Black Friday'; and in 1873 another financial panic caused much loss and suffering. By 1874 the city's growth had extended beyond the Harlem River, and in that year a part of Westchester county was incorporated with the city. The Tweed Ring, which for several years had robbed the city of millions of dollars, was convicted of fraud and in 1873 was effectually broken up. (See TWEED, WILLIAM M.)

The opening of the first Brooklyn Bridge in 1883 greatly helped inter-communication between New York and Brooklyn, which was further aided by subsequent bridge building, and by the construction of elevated railroads and surface railways. In 1886 Bartholdi's Statue of Liberty in New York Harbor was unveiled. Greater New York, a consolidation of Manhattan Island, Brooklyn, part of Queen's County, Richmond, and a part of Westchester, was created in 1898. The year 1908 saw the Hudson River tunnels to New Jersey opened, the Queensboro bridge completed, the new Pennsylvania Railroad terminal station opened, and the new Municipal Building begun. The following year the new city charter became operative. The Fulton-Hudson Celebration, held from Sept. 25 to Oct. 2, with land and water pageants made the year memorable. The new Grand Central Terminal of the New York Central Railroad was opened in 1913 and the same year the new Post Office on Eighth Avenue and 32nd Street was completed. In 1916 zoning regulations adopted by the Board of Estimate and Apportionment as a means of preventing the indiscriminate erection of structures without relation to neighborhood and intended use went into effect. In June, 1915, on the occasion of the two hundredth anniversary of the installation of the Mayor and Board of Aldermen, the city was pre-

sented with a new flag by the mayor of Amsterdam. The opening of the Catskill Aqueduct occurred in October, 1917, and the following year saw the practical completion of the dual system subway. A bomb explosion in Wall Street, September, 1920, the supposed work of anarchists, caused the death of thirty people, the injury of many more, and a large property loss. The erection of a new Liberty Pole, in City Hall Park on June 14, 1921, on the exact site of the old Liberty Pole of 1776, was an event of historic interest to New Yorkers.

During the administration of John P. Mitchell (1914-17), there was a slight reduction in the expenditures of the city. Thereafter, governmental costs steadily mounted until, in 1933, the city had the world's largest municipal budget and the largest municipal debt. The banks refused to finance it further without promise of budget reduction. Bodies of citizens charged waste and graft in the city administration. A climax was reached in an investigation of city affairs, which resulted in the removal of some officials by the governor. Mayor Walker resigned (Sept. 1, 1932) during a personal examination into his conduct of office. Out of this came the demand for a new city charter.

The outstanding event of 1939 was the opening of the New York World's Fair, at Flushing Meadow Park, in the Borough of Queens, occupying a tract of over 1,200 acres of reclaimed swamp land. This great international exposition, surpassing in scope and grandeur any fair heretofore undertaken anywhere, unfortunately failed to realize the full measure of its deserved success, because of the outbreak of war in Europe, in September, 1939. The paid attendance from April 30 to Nov. 1, the opening and closing dates, was 25,811,733 persons. Because the fair had not paid off its obligations it reopened in 1940 and entertained 19,115,269.

**Bibliography.** — Consult Chase's *New York, the Wonder City* (1931); Cooper's *New York* (1930); Cornish's *Metropolitan New York; Its Geography, History and Civics* (1925); Dreiser's *My City* (1929); Duffus' *Mastering a Metropolis* (1930); Emerson's *Old New York for Young New Yorkers* (1932); James' *All about New York* (1931); Jenkins' *The Story of the Bronx* (1912); Lamb's *History of the City of New York* (2 vols. 1880); Lynch's *Memorial History of the City of New York*

(4 vols. 1892-3); Morand's *New York* (1930); Shaw's *Nightlife* (1931); Stokes' *Iconography of Manhattan Island* (6 vols. 1915-28); Towne's *This New York of Mine* (1931); Van Loon's *Life and Times of Pieter Stuyvesant* (1928); Washington Irving High School's *New Yorker's Bicentennial Guide* (1932); the Institute of Public Administration's *Governmental Organization within Greater New York* (1931).

**New York Authority, Port of.**—A commission consisting of a chairman, a vice chairman and 12 commissioners, who are appointed, 7 from New York and 7 from New Jersey, by their respective State governors. They serve without compensation. The Port of New York Authority was created by a treaty between the two sovereign States of New York and New Jersey, signed on April 30, 1921, and approved by the U. S. Congress in August of that year. The Port District as defined includes about 1,463 sq. m. in New York and New Jersey, having 185 municipalities, and nearly one-tenth of all the population of the United States. It covers Greater New York, and portions of Westchester, Rockland, and Nassau counties and several of the most populous New Jersey counties. There are three important marine entrances to the Port, the Ambrose Channel direct from the ocean, the East River from Long Island Sound, Hudson River and Barge Canal from the Great Lakes, and the canal from Raritan Bay to the Delaware River. The water front is 800 m. on the Hudson River, the East River, the upper bays, Jamaica Bay, the Kill van Kull, the Arthur Kill, Newark and Raritan Bays, the Passaic and Hackensack Rivers.

Upon the Port of New York Authority rests the business of unifying as far as possible all terminal operations, to establish a single unified Port District. Twelve trunk railroads enter the Port—9 from the New Jersey side and 3 from the New York side. A ship enters or leaves the Port every 10 minutes of daylight hours. Nearly one-tenth of all the Nation's manufactured products and 42 per cent of our foreign trade originate here. To facilitate the movement of commerce in and out of the Port the compact gives the commissioners power to purchase, construct, lease and operate certain transportation facilities, as it undertakes development work in connection with belt lines, and local harbor improvements.

The commission is required to finance the construction of improvements without in-

creasing the burden of the taxpayers. It must raise funds on its own credit. It is not limited as to the amounts of the securities it issues, but must meet debt charges, administration and maintenance out of the earnings of its own facilities. The States of New York and New Jersey, in creating the commission, expressly forbade it to pledge the credit of the States. The States did, however, advance money for study purposes and in aid of construction, thus constituting a debt to be repaid without interest. Enterprises undertaken included the construction of the following bridges: the George Washington Memorial Bridge, the Arthur Kill Bridges and the Bayonne Bridge; and the construction of Inland Terminal No. 1 at Eighth Avenue and 15th Street, Manhattan, for the handling of freight of less-than-carload lots; also the Mid-town Tunnel. The Port Authority operates these enterprises and the Holland Vehicular Tunnel. A division of the New York Port Authority is the Bureau of Commerce, whose duty it is to protect freight rate relationships.

The controversy between New York and New Jersey on the question of lighterage charges was put before the Interstate Commerce Commission in 1932. New Jersey complained of the long-established practice of railroads to supply free lighterage from terminals to points throughout the waterfront of the port of New York. Earl N. Speer, the examiner for the commission advised the abolition of free lighterage and suggested a price based on a general minimum of 60 cents a ton by carload lots to be charged for lighterage service. The Interstate Commerce Commission, however, decided in 1934 that it would not "split the New York port district into two ports" and ruled against New Jersey. Otherwise, it granted most of New Jersey's demands in the suit, saying the lighterage limits of the harbor should be extended to many New Jersey points now excluded. Litigation continued with reference to the rates charged between New England and points on the New Jersey side of the Hudson River.

**New York, College of the City of**, since 1926 the name of the corporation under the administration and control of the Board of Higher Education of the City of New York. It includes many faculties and courses organized in three administrative units, the City College (formerly the College of the City of New York), Hunter College, and Brooklyn College. The City College has beautiful

buildings on Washington Heights and it has numerous centers throughout the city, notably on its old site at 23rd Street and Lexington Avenue. It was chartered as the Free Academy, and opened in 1849 with 143 students. In 1854 it received collegiate rank from the State legislature, and in 1866 was given its present title.

**New York Public Library, Astor, Lenox, and Tilden Foundations**, was formed by the consolidation, on May 23, 1895, of the Astor and Lenox Libraries, and the Tilden Trust. It ranks first among the libraries of the world in the extent of use by readers, and among the first six in size of book collection. On May 23, 1895, a formal agreement of consolidation was made by the trustees of the Astor and Lenox Libraries and the Tilden Trust, whereby a new corporation of twenty-five trustees assumed the control of the Astor and Lenox library buildings, the collections of about 350,000 volumes, and a combined endowment fund of about \$3,500,000 for the establishment and maintenance of a free public library and reading room. In 1901 the *New York Free Circulating Library* (incorporated 1880) was included in the public library system; and later, a number of independent libraries joined.

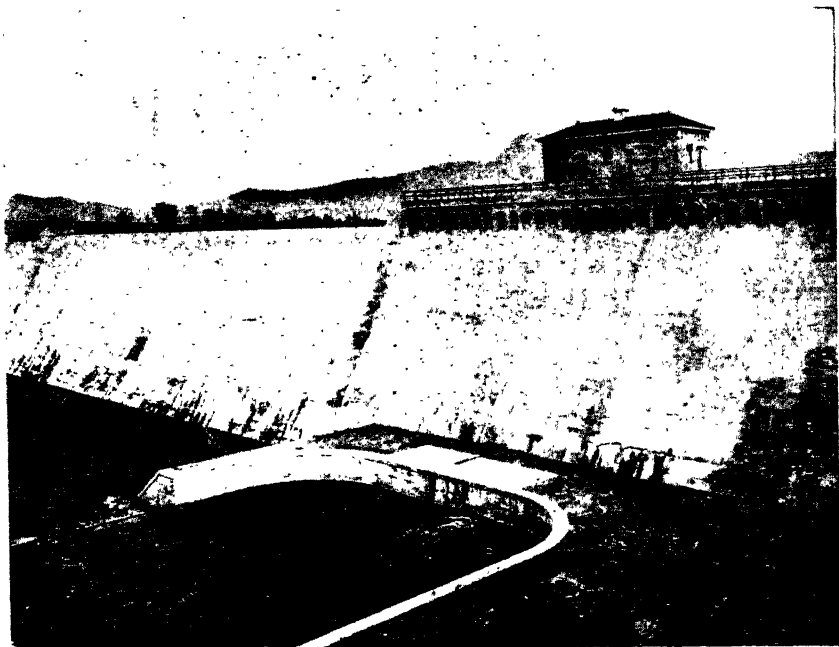
After the consolidation, the City of New York was invited to co-operate in the enterprise by furnishing a site and erecting an adequate central building; and it accordingly donated the site of the old Murray Hill reservoir at Fifth Avenue and 42nd Street. Plans by Carrère & Hastings were approved in November, 1897, and funds were appropriated for the construction of the building. The cornerstone was laid in November, 1902, and the building was formally opened to the public on May 23, 1911.

On March 12, 1901, Andrew Carnegie offered a gift of \$5,200,000 for the erection of branch library buildings in New York City, with the provision that the city should furnish sites and adequate maintenance. Of this amount, \$3,360,000 was apportioned for buildings in the boroughs of Manhattan, the Bronx, and Richmond—the field covered by the New York Public Library. The first building erected under this plan was opened in 1902; and in 1932, 45 branches and 11 sub-branches were in operation, of which 39 occupied Carnegie buildings.

The New York Public Library is made up of the Reference and Circulation Departments, the former being financed by the corporation, the latter principally by the city.

The Reference Department occupies the greater part of the central building. The Circulation Department carries on its work through the branch library buildings, and occupies part of the central building as well. The Municipal Reference Library, located in the Municipal Building on Park Row, also belongs to the New York Public Library system. Features of the Circulation Department are the library for the blind, having a circulation of some 45,000 volumes, and

**New York State Barge Canal**, the name applied to the canal system of New York State, comprising the Erie, Champlain, Oswego, and Cayuga and Seneca Canals, which have been enlarged and improved. The line of the Barge Canal departs from that of the original canals throughout considerable of its length, the policy being to canalize the various rivers and streams encountered rather than to follow along the sides of the hills. It leaves Lake Erie at Buffalo, follows the



*Delta Dam.*

New York State Barge Canal System.

the extension division which supplies collections to homes in outlying districts, charitable institutions and city departments. Work for children includes story telling and clubs of the various branches. A training course in library work is given during a two-month period each autumn.

In 1939, the Library contained 2,687,377 books and pamphlets in the Reference Department and 1,390,306 in the Circulation Department. Among the publications of the Library are the *Bulletin of the New York Public Library*, a monthly periodical containing bibliographies and other library material, and the *Municipal Reference Library Notes*.

Niagara River to Tonawanda Creek, then parallels the shore of Lake Ontario to the Oswego River, and continues in an easterly direction to join the Hudson River at Waterford, thus forming a continuous waterway from Buffalo and the Great Lakes to New York City. The original Erie Canal was begun in 1817, largely through the foresightedness of Governor DeWitt Clinton, and was completed in 1825 at a total cost of \$7,143,789. In 1877 Auditor Schuyler stated the total amount of tolls collected on the entire Canal system was \$130,034,897. The cities of Albany, Troy, Schenectady, Little Falls, Utica, Rome, Syracuse, Rochester, Lockport, Tonawanda, Buffalo, Oswego, and Whitehall

owe much of their development to the construction of the State canals.

In April 1903, the *Barge Canal Law*, framed in accordance with the recommendations of the committee, was signed by Governor Benjamin B. Odell, Jr., and approved by the people at the November election. This law appropriated \$101,000,000 for the improvement of the Erie, Champlain, and Oswego Canals to a depth of 12 ft., a minimum width of 75 ft. on the bottom in land sections, and 200 ft. in rivers and lakes. The preparation of plans, specifications, and estimates was begun at once, and the first contract was awarded on April 3, 1905. On May 15, 1918, the entire Canal was opened for traffic, though much incidental work remained to be completed after that date.

An almost unlimited water supply is available for the western section of the improved Erie Canal by tapping the Niagara River at Tonawanda. Provision has been made for supplying the long levels between Tonawanda and Rochester with a minimum of 1,237 cubic ft. per second. There are 35 standardized locks on the Erie branch of the Barge Canal; 11 on the Champlain, 7 on the Oswego, and 4 on the Cayuga-Seneca. These locks are 300 ft. long between gates, 45 ft. wide, with a depth of 12 ft. of water over the mitre sills, and the lifts vary from 6 to 40½ ft. The lock at Little Falls is the highest, with a lift of 40½ ft. The locks and dams are operated, the canal lighted, and the lock tenders' houses and power houses heated by electricity, generated for the most part at the various locks and dams. The system of animal towage has been entirely done away with, and no tow path is provided on the improved canal except for temporary use. Boats either move under their own power, or are towed by tugs. The Terminal Act of 1911 stipulated definitely where the terminals should be and fixed the character and amount of money to be expended on each. The places specified included Buffalo, North Tonawanda, Tonawanda, Rochester, Lyons, Syracuse, Oswego, Utica, Rome, Troy, Albany, fourteen localities in New York City, Herkimer, Little Falls, Fort Plain, Schenectady, Canajoharie, Rouses Point, Port Henry, Whitehall, Plattsburg, and Lockport.

The total cost of the State Barge Canal is estimated at \$168,000,000. Navigation of the canal is free; there are no toll charges but there are certain terminal and storage fees. This water system can accommodate an annual traffic of 20 million tons, but actually

carries only about 3 million tons per annum.

**New York University**, an independent educational institution, situated in the City of New York. It is supported by endowments, current gifts, and the tuition fees of some twenty thousand students, men and women. It bears no organic or affiliated relationship to the College of the City of New York, nor must it be confused with the State Department of Education, which is known as the University of the State of New York. It is a non-sectarian institution. The University offers standard curricula leading to baccalaureate degrees in liberal arts, pure science, fine arts, and music; professional courses leading to degrees in law, education, medicine, dentistry, engineering, commerce, retailing, and business administration; and wide opportunity for graduate study and research, leading to the graduate degrees. In addition to the regular courses there are offered special courses and lectures in great variety. Its schools are not confined to a single campus, but occupy strategic locations at four centers of New York City. The first building, a fine Gothic structure, was opened in 1835. It was here that Professor Samuel F. B. Morse invented the recording telegraph (1835). The original building was replaced, in 1894, by a modern eleven-story structure and the physical properties of the University at this center have since expanded, year by year, until now all of the buildings occupying three block fronts on Washington Square East, together with other properties in that vicinity, serve University purposes. At the same time, the activities of the institution have been extended to three other centers of the city. In 1891, a tract of land was purchased at University Heights, a beautiful campus site in the upper part of the city, eleven m. n. of Washington Square. Successive additions have increased this holding to some forty-five acres. The Medical College and the College of Dentistry, with classrooms, laboratories, libraries, and clinics, occupy six buildings in the Bellevue Hospital district, mid-town. At the lower end of Manhattan Island, the old Trinity School building near the head of Wall Street houses the Graduate School of Business Administration, and undergraduate business courses.

The Hall of Fame for Great Americans, completed in 1900, is a semi-circular structure, two stories in height. The second story is a colonnade 500 ft. in length, joining three of the University buildings, and containing 150 panels for the inscription of the names

of famous Americans. The first story consists of a long corridor and six separate rooms, which are eventually to constitute the Museum of the Hall of Fame, designed to preserve mementoes of persons whose names are commemorated there.

**New York, University of the State of,** the designation of the corporate body charged with the supervision of the educational system of New York State. It includes in its membership all elementary, secondary, and higher institutions in the State. It is charged with the general management and supervision of all the educational work of the State, and supervises admission to and the practice of certain professions and occupations, as medicine, pharmacy, dentistry, public accountancy, architecture, engineering, nursing, etc. It licenses teachers, and controls the system of examinations and the apportionments to the schools, the State appropriations, and the interest from school funds.

The governing Board of the University is the Board of Regents. The President of the University, who is at the same time Commissioner of Education and chief executive of the University, is elected by the Regents and serves during their pleasure. The administrative home of the University is the State Education Building, in Albany, N. Y., which was dedicated Oct. 15-17, 1922.

**New York World's Fair of 1939,** was formally opened April 30, 1939, at Flushing Meadow Park, in the Borough of Queens, Long Island. The 1200-acre site of the Fair, an area 50 percent larger than that of Central Park, New York, in approximately the geographical center of the city, and about nine miles from Broadway and 42nd Street.

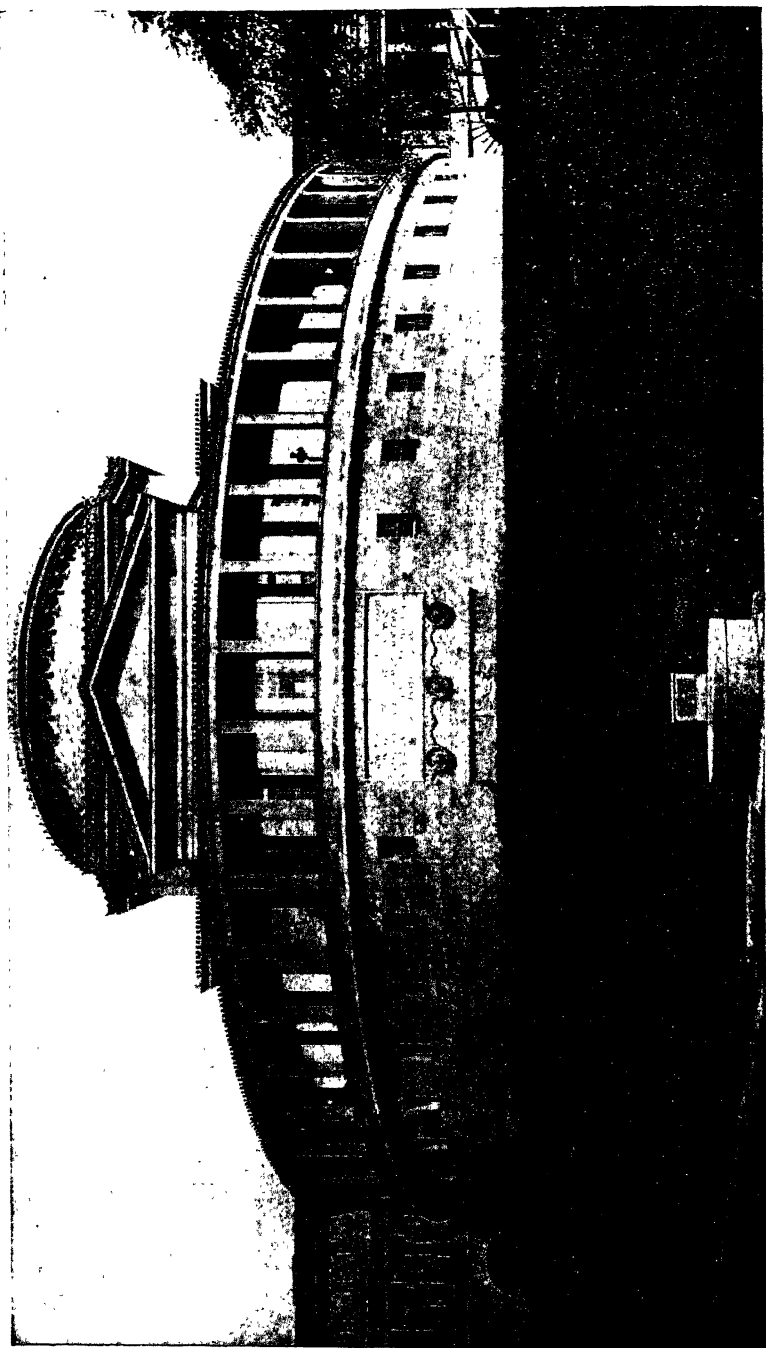
The most extensive exposition ever held, exceeding all previous international fairs in breadth of scope and in splendor, having transportation facilities for 160,000 an hour; 300 structures, including 30 major buildings to house exhibits from every part of the world; more than 15 miles of drives; 20,000 benches; 10,000 shade trees; and a Theme building costing \$1,200,000. The total cost of the Fair was about \$125,000,000, financed in part by a 4 percent debenture bond issue of \$27,829,500 at public subscription. Until the Fair closed Nov. 1, 25,811,733 had paid admissions. However, there was still a heavy unpaid debt and it was reopened in 1940. Despite the fact that many foreign nations closed their exhibits because of World War II, the attendance the second year was 11,115,269.

**New Zealand, Dominion of,** British colony in the South Pacific Ocean, 1,200 m. s.e. of Australia. Total area, 103,862 sq. m.; length, 1,100 m.; average breadth, 120 m. It consists of two long, narrow main islands, North Island and South Island, separated by Cook Strait, and a much smaller island, Stewart, separated from South Island by Foveaux Strait. The coast of New Zealand is high and rugged, and in parts indented with good harbors and inlets. A chain of mountains, broken by Cook Strait, and branching off into side ranges, traverses the two islands, practically dividing them into an eastern and a western part. Extensive glaciers traverse these slopes, descending to within 700 ft. of sea level on the western side; vast snow fields crown their summits. On the eastern coast are nearly all the fertile plains, most of the population, and the principal towns and harbors. In the peninsula north of Auckland are several harbors, the finest being the Bay of Islands and Waitemata, on which Auckland lies.

The climate, though varied, is salubrious and bracing, never very hot and seldom very cold. For variety, picturesqueness and wild grandeur, the scenery of New Zealand is unrivalled in the Southern Hemisphere. In North Island is the wonderland of the volcanic belt, remarkable for its hot lakes and pools, which possess curative value for rheumatic and skin diseases, its boiling geysers, steaming fumaroles, sulphur basins, and pumice plains. These and other interesting phenomena are scattered broadcast over a wide belt, stretching from the extinct Ruapehu to the active volcano of White Island in the Bay of Plenty. In South Island the Central Alps of the Mount Cook district display the finest glaciers in the temperate zones, splendid clusters of snowy mountain peaks, and stupendous valleys set off by a series of placid yellow-tinted lakes. The most important plants of New Zealand are the timber trees, especially the varieties of pine (kauri, totara, rimu, kahikatea, and matai) and the beeches. There are also large numbers of seed plants, ferns, and fern allies, and an extensive Alpine vegetation.

New Zealand contains abundant mineral wealth, gold and coal being the principal products. There are large deposits of excellent coal, especially on the west coast of South Island. Considerable attention has been given to whaling, and whalebone and whale oil are exported. By virtue of its diverse and equable climate, abundant rainfall, and fer-





*The Hall of Fame, New York University.*



*Niagara Falls and Gorge.*

tile soil, New Zealand is a splendid country for agriculture and pastoral pursuits. Cereals are grown extensively; maize on the east coast of Auckland province; wheat and barley in the Canterbury Plains; and oats and rye in Otago. The most important industry of New Zealand is the raising of sheep, the annual value of the wool export alone being over a third of the total export trade. The shipping of frozen mutton and lamb has also reached considerable proportions.

Cattle are raised for the growing dairying industry and for beef. The leading industries are as follows: meat freezing and preserving, butter and cheese, sawmills and sash and door factories. Railways, telegraphs, telephones, and the postal service are owned and controlled by the government.

*History.*—New Zealand was discovered by Tasman, the Dutch navigator, in 1642, but did not become widely known until Captain Cook circumnavigated and charted the coast in 1769. The natives found by the early explorers were evidently of Polynesian origin, who called themselves Maoris, and who had displaced an earlier and darker indigenous race. No colonization took place until 1840, when Captain Hobson concluded a treaty with the Maoris, whereby they ceded the sovereignty of the islands to the British Crown. In 1907 the designation Colony of New Zealand was changed to Dominion of New Zealand. During recent years New Zealand has attracted world-wide attention by reason of her advanced socialistic legislation, including industrial conciliation and arbitration, employers' liability, and workmen's wages acts, a comprehensive factories act, and an old-age pensions law. In 1920 a mandate over western Samoa was given New Zealand by the League of Nations; p. 1,641,000.

**New Zealand Spinach**, an early hardy annual plant. Its young leaves are eaten.

**Next Friend**. A person who, by reason of some legal disability, is not *sui juris*—e.g., an infant who has no guardian, or a lunatic not so found by inquisition—is permitted to sue through his 'next friend,' such person having no pecuniary or other interest in the suit.

**Ney, Michael** (1769-1815), French marshal, was born in Saarlouis. On the establishment of the empire Ney was made marshal of France (1804). In 1805 he stormed the entrenchments of Elchingen, for which he was created Duke of Elchingen. He distinguished himself at Jena and Eylau, and his conduct at Friedland earned him the title

from Napoleon of 'le brave des braves,' and the grand eagle of the Legion of Honor. He covered himself with glory at Smolensk and Borodino, and was rewarded with the title of Prince of the Moskwa. After the capture of Paris he urged the Emperor to abdicate, and submitted to Louis XVIII., who loaded him with favors. On Napoleon's return from Elba, Ney was sent against him at the head of 4,000 men; but the old ties proved too strong, and with most of his soldiers he went over to his former master's side. He was condemned to death for high treason, and was shot in the garden of the Luxembourg on Dec. 7, 1815.

**Nez Percés**, a tribe of N. American Indians, so called by the French-Canadian fur traders, but now known as Sahaptins or Shahaptins. They formerly inhabited the region around the Columbia River, but they now live on reservations in Idaho and Washington, where they number about 2,000.

**Ngan-ching**, capital of province Ngan-hui, China, on the Yang-tse-kiang, about 175 m. e. of Hankow. It was opened to foreign trade in 1897. The chief industry is the manufacture of India ink; p. 100,000.

**Ngan-hui**, inland province, China; area, 54,826 sq. m. The chief export is rice, the section n. of the Yang-tse-kiang producing a greater exportable surplus of rice than any other district in China. Other exports include tea, wheat, cotton, and indigo. Opium, hemp, and paper are also produced; p. 20,198,840.

**Niagara**, town, Lincoln co., Ontario, Canada, on Lake Ontario, at the mouth of the Niagara River, 15 m. below the Falls, and 34 m. s.e. of Toronto. It is a summer resort, the first capital of Upper Canada.

**Niagara Falls**, city, New York, Niagara co., on the e. side of the Niagara River, at the Falls, 16 m. n.w. of Buffalo. The Niagara River is here spanned by three bridges. The city is a well-known resort for tourists, and is the electro-chemical center of the United States. The extensive development of hydraulic power from the Falls of Niagara has made the city an important industrial center. The city's principal manufactures are flour, paper, aluminum, graphite, carborundum, plate wire, emery wheels, haircloth, gas machines, machinery, calcium carbide, bleaching powder, other chemicals, and shredded wheat; p. 78,029.

**Niagara Falls** (formerly **Clifton** or **Suspension Bridge**), city, Welland co., Ontario, Canada, on the w. bank of Niagara River,

near the Great Falls. It is connected with Niagara Falls, N. Y., by the Suspension Bridge. Here are some of the largest electrical power plants in the world. Industries include the manufacture of cereal foods, carborundum, clothing, wire, canned goods, silverware. Near here, on July 25, 1814, was fought the Battle of Lundy's Lane; p. 18,963.

**Niagara Fort**, a defensive work located at the mouth of the Niagara River, in New York State.

**Niagara River and Falls.** The Niagara River flows from Lake Erie to Lake Ontario, a course of 33 m., and forms part of the boundary between New York State and the province of Ontario. For about 20 m. of its course, from Buffalo to the Falls, it flows as a broad, smooth stream, with low banks. Then a complete change occurs, and the river is suddenly converted into a series of rapids and an immense cataract that form one of the natural wonders of the world—the famous Niagara Falls. Above the Falls appear several islands, of which the largest, Goat Island, divides the river into two unequal parts as it plunges over the precipice. For some distance below the Falls there is smooth current, the mass of water which pours over the precipice sinking, and only coming to the surface again 2 miles below, where the Whirlpool Rapids begin; a little lower is the Whirlpool, where a sharp turn sends the waters hurling against the Canadian side, and then sweeping round in a great eddy before they find a vent at a right angle with their former course. Beyond the Whirlpool the river is broader and less steep, and in the remaining seven miles of its journey the fall is only about three feet.

The smaller of the two falls lies to the American side, and is known as the American Falls. Under the ledges which are the chief support the spray has formed a series of cavernous recesses, one of which is accessible and is known as the 'Cave of the Winds.' The part between Goat Island and the Canadian shore is much the larger, and is known as the Canadian or Horseshoe Fall. The average flow of water over both falls is estimated to be 222,400 cubic feet per second, representing a potential horse power of some 4,900,000. Because of their remarkable beauty, Niagara Falls attract great numbers of tourists, over 800,000 people visiting the region every year. There are reservations on both sides of the Falls, the New York State Reservation occupying an area of 107 acres on the American side, and the

Queen Victoria Niagara Falls Park 15.4 acres on the Canadian side.

Geologically, Niagara is a recent phenomenon—wholly post-Glacial. Its history and origin are connected with the readjustments of drainage produced by the random distribution of drift. The crest line of the Falls is still receding gradually under the action of the waters, the Canadian side showing a backward movement of from two to four feet per annum, the American side half a foot. Niagara is by no means the highest waterfall in the world, but so vast a volume of water rushes over it—another estimate calculates 93,000,000 gallons a minute—that it is by far the greatest.

In 1906 the Burton Act was passed by Congress, which prohibited the diversion of more than 15,600 cubic feet of water per second for power purposes in the United States, and limited the importation of electric power generated in Canada. The provisions of this Act extended over a period of three years, and it was renewed, finally expiring in March, 1912. In the meantime, however, a treaty was concluded between the United States and Great Britain, limiting the total diversion of water for power purposes of 56,000 cubic feet per second, of which Canada is allowed to divert 36,000 cubic feet, and the United States 20,000. On the American side about 300,000 horsepower is generated, and on the Canadian side about 955,000 horsepower. The largest single hydro-electric development in the world, the Queenstown-Chippewa power plant, is located on the Canadian side.

**Niagara University**, a Roman Catholic institution at Niagara Falls, N. Y., founded in 1856, and established as a university under its present title in 1883.

**Nibelungenlied**, an old epic poem in Middle High German, that takes rank after the Homeric poems among the great epics of the world. Who was its author, or who cast it in its present form, is unknown. The oldest elements of the work must have been long current in the form of popular songs or versified sagas; but the incidents of the story as recounted in the epic seem to have been fused into a unity some time previous to the 12th century.

**Nicæa**, ancient city, Asia Minor, in Bithynia, situated on the eastern shore of Lake Ascania. The modern name of the town is Isnik. It is famous in ecclesiastical history for two Councils held in it.

**Nicaragua**, Central American republic, extends directly across the Isthmus of Panama.

The total area is 51,660 sq.m. The Central American Cordilleras form the backbone of the country, running n.w. and s.e., at a distance of 12 to 30 m. from the Pacific, and attaining elevations of 4,000 and 5,000 ft. above sea-level. East of the main mountain range is a broad upland region broken by deep ravines and mountain spurs. Thick forests clothe the uplands, yielding dye-woods, gums, resins, rubber, mahogany and other cabinet woods, camphor, spices, and medicinal products. The fauna is tropical, and includes pumas, monkeys, alligators. Parrots, macaws, and humming birds are abundant.

The mountain spurs e. of the main chain are rich in minerals. Gold is mined in the neighborhood of Libertad on to Matagalpa, in the heart of the country, and silver near the sources of the Segovia River in the n. Copper, lead, salt, and sulphur are found around Matagalpa and Leon, and oil, coal, nickel, zinc, quartz, tin, iron, and quicksilver. Coffee and bananas are the staple crops, coffee being grown chiefly in the western half of the country and bananas in the eastern half. Coconuts, plantains, citrus fruits, yucca, and pineapples also flourish in the eastern part; sugar, cacao, maize, beans, rice, wheat, and tobacco in the highlands. Cattle, hogs, and goats find abundant pasture.

Manufactures of shoes, leather goods, candles, soaps, cigars, cigarettes, beer, hats, and furniture partly supply local needs and are protected by high duty. The Indians are noted makers of gold chains, hammocks, straw hats, and pottery. The state religion is Roman Catholic; there is freedom of worship. School attendance is compulsory between the ages of 6 and 14. Secondary education is provided in 2 normal schools, 3 national institutes, and 16 *colegios*. Nicaragua, like the states north of it, was a center of Aztec civilization. It joined the federation of the Central American states in 1823, a connection which lasted 16 years. In 1838 Nicaragua established an independent government.

The history of Nicaragua after separation from Spain until 1865 is a record of war and dissension, including trouble with Great Britain over the Mosquito Coast, which was regarded as a British protectorate until the signing of the Clayton-Bulwer Treaty in 1860. Nicaragua has continued politically unstable to the present day. Because of this the United States government has had to intervene a number of times, the last time in 1926. At this crisis Colonel Henry L. Stimson was

sent as special representative of President Coolidge to aid in working out a way to peace. The elections of 1928, 1930, and 1932 were successfully accomplished under American supervision. Operations of rebels under Sandino against the political adjustment made through American intervention became especially serious in 1930 and continued in 1931. In spite of this, the United States in 1931 declared that the Marines would be withdrawn when they could be replaced by native national guards; advised Americans to leave the country if they feared attack, and recommended that roads and trails be built throughout the outlaw district. A loan of \$1,000,000 was obtained from New York for this purpose. The U. S. Marines withdrew Jan. 2, 1933, when the rebel leader Sandino made peace with the government. Sandino and his brother and two aides (generals) were seized and shot by national guardsmen on Feb. 21, 1934. Managua was practically destroyed by earthquake (March 31, 1931) followed by 5 days of fire. Its rebuilding proceeded slowly because of the general economic crisis. The government transferred its offices temporarily to Masaya. The Constitution having been virtually abrogated by the congress in 1938, failure of a constitutional convention by reason of factional differences to adopt a new Constitution, left President Samozá in control of the government, 1939; war was declared on Ger., It., and Jap., 1941; p. 1,172,000.

**Nicaragua Canal**, a proposed ship canal, to cross Central America, connecting the Atlantic and Pacific by way of the San Juan River and Lake Nicaragua. With definite acceptance of the Panama route the Nicaragua project was held temporarily in abeyance. A treaty, concluded by Secretary Bryan and Minister Chamorro in 1914, was ratified in 1916, whereby the United States Government, by the payment of \$3,000,000, acquired (1) exclusive rights necessary and convenient to construct, operate, and maintain an inter-oceanic canal by way of Lake Nicaragua or of any other route over Nicaragua; (2) a 99-year lease (with option to renew) of Great Britain and Little Corn Islands in the Caribbean Sea, and the right to establish, operate, and maintain a naval base at such place on the territory of Nicaragua bordering on the Gulf of Fonseca as the United States may select. In 1929-31 an official survey of the route by the United States Government reported that the canal would cost \$700,000,000, whereas a third set of locks on the Pana-

ma Canal would cost only \$140,000,000; otherwise the report favored the project. It was again under discussion in 1939.

**Nice**, town, capital of the department of Alpes Maritimes, France, and a favorite winter resort for invalids and pleasure seekers, is situated on the Mediterranean coast, at the mouth of the Paillon, 110 m. s.w. of Genoa and 640 m. from Paris. The Old Town, with its narrow winding streets, occupies the e. bank of the river, while the New Town and the residential quarter of the foreign visitors are on the opposite side. Nice exports wine, fruits, flowers, olive oil, perfumery, and soap. There are factories for the manufacture of furniture, tobacco, confectionery, silk, rubber and metal goods; p. 242,000.

**Nicene Creed**. See **Creed**.

**Nicholas**, the name of five popes and an antipope.—**NICHOLAS I.** (858-67), of Roman birth, succeeded Benedict III. He was a vigorous upholder of the power of the Holy See. **NICHOLAS V.** (1447-55), remodelled, and may almost be said to have founded, the Vatican Library.

**Nicholas Nicolaievitch** (1856-1929), Russian Grand Duke, commander of the Russian armies in the World War, was a grandson of the emperor Nicholas I and uncle of the last emperor, Nicholas II. He showed considerable ability during the first year of the war, but lack of material resources and superior generalship of the enemy prevented him from achieving any decisive success. He resided for the last decade of his life in France.

**Nicholas I.** (1796-1855), emperor of Russia, son of Paul I. and Maria Feodorovna, succeeded to the throne in December, 1825, on the death of his eldest brother, Alexander I. On being refused permission to establish a protectorate over the Christians in Turkey, entered upon war with the Porte (1854). France and England came to the aid of Turkey, however, and the tsar found himself involved in the Crimean War, during the course of which he died (March 2, 1855).

**Nicholas II.** (1868-1918), emperor of Russia, son of Alexander III., and the last of the Romanoff dynasty, succeeded to the throne on the death of his father, in 1894. His reign was unhappy from its beginning. In the Russo-Japanese War (1904-05) Russia suffered defeat at the hands of Japan. Gradually the forces of popular government gained strength, the conduct of the war against Germany and the maladministration of the supplies added to the general discontent, and

Nicholas was forced to abdicate both for himself and his son. He was executed with his wife and children by the Bolsheviks, in July, 1918. There has been much interest aroused in recent years by the claim that one of the daughters, the Grand Duchess Anastasia escaped assassination. She has been both recognized and denounced.

**Nicholas I.** (1841-1921), King of Montenegro, in 1860 succeeded Danilo I. During his reign Montenegro obtained from the powers recognition of its independence in the Treaty of Berlin (1878); and in 1910, with the consent of the powers, Nicholas assumed the title of king. He granted the country a constitution (1905) and a parliament.

**Nichols, Edward Leamington** (1854-1937), American physicist, was born in England. After holding chairs at Central University, Ky. (1881-83), and at the University of Kansas (1883-87), he became professor of physics at Cornell University in 1887; retired in 1919. He has published: *The Galvanometer* (1894), *Elements of Physics*, with Prof. W. S. Franklin (3 vols., 1897); *Outlines of Physics* (1897).

**Nichols, Ernest Fox** (1869-1924), American physicist, born in Leavenworth, Kans. In 1898 he became professor of physics in Dartmouth College, and in 1903 professor of experimental physics in Columbia University. In 1909 he was elected president of Dartmouth College. He remodelled and improved the Crookes radiometer; measured (with Rubens) heat waves four times as long as any hitherto known; measured heat radiation from Arcturus, Vega, Jupiter, and Saturn; and (with G. F. Hull) measured the pressure exerted by a beam of light. He was a member of the National Academy of Sciences.

**Nicholson, Sir Francis** (1660-1728), English administrator, born in England. He was lieutenant-governor of Virginia in 1690-4, governor of Maryland in 1694-8, of Virginia in 1698-1705, of Acadia in 1713-1719, and of South Carolina in 1719-25.

**Nicholson, James** (1737-1804), American naval officer, born at Chestertown, Md. At the outbreak of the Revolutionary War he was placed in command of the American man-of-war *Defense*, and captured several British prizes. In 1777 he became commander-in-chief of the Navy.

**Nicholson, Meredith** (1866- ), Am. author, born in Indiana; wrote *The House of a Thousand Candles*; *The Port of Missing Men*; *Otherwise Phyllis*, *A Hoosier Chronicle* (1912), and *The Poet* (1914).

**Nicias** (c. 470 to 413 B.C.), an Athenian statesman and general, was a member of the aristocratic party, and opponent of the war policy of Pericles; but it was only after the death of that statesman that he became prominent. After 427 B.C. he appears to have been elected general almost every year. Nicias opposed, but was forced to lead the great expedition to Syracuse in 415 B.C. The enterprise terminated in disaster, and Nicias, surrendering with his men, was put to death by the Syracusans.

**Nickel**, Ni, 58.7, a metallic element belonging to the iron-cobalt group of the periodic system. The greater part of the world's supply is obtained from the nickeliferous pyrrhotite of Ontario, and the garnierite (hydrated silicate of nickel, iron, and magnesia) found in New Caledonia. Other ores worked are nickel blende, NiS, and kupfernickel, NiAs, found in Saxony and Bohemia. The metal is extracted from the ores, which are roasted for removing the arsenic (if present) and excess of sulphur, by the furnace method, Mond or gas method, or the wet process. Nickel is hard, malleable, ductile, and tenacious, of a white color, somewhat magnetic, and tarnishes but little in the air. Its specific gravity is 8.9, it melts at about  $1,450^{\circ}\text{C.}$ , and is a fair conductor of electricity. It forms two classes of compounds, the corresponding oxides being NiO and Ni<sub>2</sub>O<sub>3</sub>.

Nickel is used to a certain extent for the manufacture of crucibles, tongs, spoons, but is chiefly valuable in its alloys. Of these, nickel steel, containing about 3 per cent. of nickel, is of high tensile strength, while alloys containing more nickel have valuable magnetic properties, and scarcely expand on heating. German silver, which is a brass with from 15 to 25 per cent. of nickel, is useful for spoons and for wires for electrical resistances. Platinoid is a similar alloy, with about 2 per cent. of tungsten in addition. Nickel with 75 per cent. of copper is used for coinage. Nickel-plating by electro-deposition from a bath of the double sulphate of nickel and ammonium, plates of nickel being used as anodes, is extensively used to produce a protective and beautifying coating on iron, brass, and copper articles. A recent product is *Monel metal*, an alloy of about  $2\frac{1}{2}$  parts copper to 1 part nickel, which results from smelting the Sudbury ores without separation; it is about as strong as steel, is non-corrosive, and therefore has important possibilities.

**Nickel Plating.** See **Electro-deposition.**

**Nicol, William** (1768-1851), inventor of the polarizing prism. He effected a great advance in the method of cutting sections, which materially assisted him in his investigations into the structure of fossil woods.

**Nicolai, Otto** (1810-49), German operatic composer, was born at Königsberg. His operas enjoyed a large measure of favor, and he also took a high position as a conductor. His most successful work is a comic opera, *The Merry Wives of Windsor* (1849).

**Nicolaitans**, a heretical and probably Antinomian sect in the apostolic church. See McGiffert's *Christianity in the Apostolic Age* (1897).

**Nicolas, Saint**, patron saint of Russia, was bishop of Myra in Lycia in the 4th century. He is regarded as the patron saint of merchants and of travelers by sea and land, but also especially of the young and of scholars. He still survives in the Santa Claus of Christmas rejoicings.

**Nicolay, John George** (1832-1901), American author, was born in Essingen, Bavaria. On Lincoln's nomination for the presidency he became his private secretary, and after the election was assisted in his duties by the late Secretary John Hay. They early formed their plan for their *Abraham Lincoln: A History* (10 vols. 1890), completed so many years after. In 1881 he published a volume on *The Outbreak of the Rebellion*.

**Nicole, Pierre** (1625-95), French Jansenist author, born at Chartres. Coming into collision with the religious authorities he in 1679 found a refuge in Flanders, but four years later was again in Paris. He was an able dialectician and controversialist. Among his works is *Essais de Morale* (later ed. 14 vols., with Life by Goujet, 1767-82). He was also the chief author of the Port Royal *La Logique*.

**Nicolini, Ernesto** (1834-98), French singer, was born (Ernest Nicolas) at Saint Malo, France, and was the son of a Dinard inn-keeper. He graduated (1855) in comic opera at the French National Conservatory with a second *accessit*, and filled an engagement at the Théâtre de l'Opéra Comique. In 1859 he removed to Italy and studied for grand opera, singing in that country and other parts of Europe until 1872, when he gave a successful presentation of *Faust* in London. He joined Adelina Patti's company as principal tenor, sang with her for several years in Europe and this country, and after her divorce

from the Marquis de Caux, married her at her home, Craig-y-nos Castle, in Wales, in 1886.

**Nicoll, James Craig** (1847-1918), American marine painter, born in New York, was the founder and later president of the American Water Color Society. He became a member of the National Academy of Design in 1885. His well-known pictures are *On the Newport Rocks*, *Sunlight on the Sea*, and *A Summer Surf*.

**Nicoll, William Robertson** (1851-1923), Scottish author and critic, was born at Lumsden, Aberdeenshire. In 1886 he went to London, and started the *British Weekly*, and in 1891 established the *Bookman*. Among his works are *Literary Anecdotes of the Nineteenth Century* (1895); *The Daybook of Claudius Clear* (1905), and *Princes of the Church* (1921). He also originated and edited among other works, *The Expositor's Bible*, a complete edition of the *Works of C. Brontë* (1902), and was joint-editor of an *Illustrated History of English Literature* (1906).

**Nicollet, Jean Nicholas** (1786-1843), French-American explorer and astronomer, born in Cluses, France. In 1836 he explored the headwaters of the Mississippi. He acquired a large amount of ethnological data regarding the Indians, and recorded valuable scientific observations. He then, on the solicitation of the U. S. government led an expedition which explored much of the country west of the Mississippi. He was the author of: *The Geology of the Upper Mississippi Region and the Cretaceous Formation of the Upper Missouri* (1841).

**Nicolls, Matthias** (c. 1630-87), English colonial official, born at Plymouth. He came to America in 1664 as secretary of the new commission to regulate New England, and after the conquest of New York was made secretary of that colony, where, at the instance of Gov. Nicolls, he formulated the code of laws afterward called the 'Duke's Laws.' He remained secretary of the colony until 1680 except during the Dutch occupancy (1673-4), and also served as admiralty judge and mayor of New York.

**Nicolls, Sir Richard** (1624-72), English soldier, was born at Ampthill, Bedfordshire. At the Restoration he became groom-of-the-bedchamber to the Duke of York, and in 1664 was entrusted by him with the conquest of New Netherland, which the Duke had received by grant from Charles II. Stuyvesant was obliged to surrender New Amster-

dam to him, Aug. 26, 1664, and the English authority was rapidly extended over the whole territory. Nicolls changed the name of the province and its chief town to New York. He promulgated the code known as the 'Duke's Laws' (1665) and granted a charter incorporating New York as a city the same year. He served as governor until 1668, returned to England, and was killed in the naval battle at Solebay during the Anglo-Dutch war.

**Nicomedia**, anc. city in Bithynia, Asia Minor, at e. end of Sea of Marmora, was founded by Nicomedes I. in 264 B.C., and became a colony under the Romans. It was there that Hannibal died and Arrian was born. See ISMIR.

**Nicosia**. (1.) Or **Lefkosia**, tn. and cap., isl. of Cyprus, in E. Mediterranean, 23 m. n.w. of the seapt. Larnaca; originally fortified by Constantine. In 1193 Richard Cœur de Lion presented it to Guy de Lusignan; p. 23, 700. (2.) Nicosia, Italy; p. 12,519.

**Nicot, Jean, Sieur de Villemain** (1530-1600), was born in Nîmes, and was ambassador from Francis II. of France to Lisbon. There he obtained from a Flemish merchant seeds of the tobacco plant, and carried them back with him to France (1560), where the plant was named *Nicotiana*.

**Nicotiana**, a genus of mostly herbaceous plants belonging to the order of Solanaceæ. They are natives of America and the Pacific islands. The most important species is *N. tabacum*, the common tobacco.

**Nicotine**,  $C_{10}H_{17}N_2$ , a di-acid alkaloid occurring in the tobacco plant, from which it may be obtained by distilling the extract with lime. Nicotine is very poisonous.

**Nichteroy**, cap. of state Rio de Janeiro, Brazil, on Bay of Rio, 2 m. e. of the capital. Down to 1894 it was the seat of the state government; p. 108,233.

**Nictitating Membrane**, or **Third Eyelid**, a structure best developed in birds. In mammals generally the third eyelid is only slightly developed.

**Niebuhr, Barthold Georg** (1776-1831), German classical scholar, was born at Copenhagen. In 1810 he became royal historiographer and professor at Berlin. He then began his lectures on Roman history, the first two volumes of which were published in 1812 (ed. Schmitz, 1893). The first two volumes of his *History of Rome* were republished in 1827 and 1828; a third appeared after his death (Eng. trans. 1847-51). His history has been superseded by later works, especially by that



of Mommsen; but it was epoch-making both in its rejection of the legendary element in early Roman history, and in its reconstruction of the early political and social developments and institutions.

**Niebuhr, Reinhold** (1892- ), clergyman, was born in Wright City, Mo. Professor of religion and applied Christianity in Union Theological Seminary since 1928; editor *World Tomorrow*. Author of *The Social Sources of Denominationalism* (1929); *The Nature and Destiny of Man* (1941).

**Niederwald**, mountain ridge (1,150 ft.), on r. bk. of Rhine. Opposite Bingen, where the Rhine makes a bend to the n., is the National Monument, a memorial of the Franco-German war of 1870-1, a magnificent work.

**Niehaus, Charles Henry** (1855-1935), American sculptor, born Cincinnati, O. His work includes statues for the Capitol at Washington, the Conn. State House, Library of Congress, and relief work for Trinity Church, N. Y. City.

**Niel, Adolphe** (1802-69), French marshal, born at Muret (Haute-Garonne). For distinguished service in the Italian campaign of 1859 he became marshal of France. Appointed minister of war in 1867, he was reorganizing the army when he died. The well-known yellow rose is named after him.

**Niello**, the engraving of metals, chiefly silver, with designs filled in with a metallic amalgam; the word also connotes tracings on paper, taken from metal plates, the art of line engraving being thus discovered, it is suggested, by Tommaso Finiguerra (1452). Benvenuto Cellini was the last great niello worker.

**Niemen**. See **Memel**.

**Niemoeller, Martin** (1892- ), German pastor, son of a Lutheran minister. He joined the German navy when 18 years old and was a sublieutenant in World War I, commanding U-boats, establishing a record for destroying 55,000 tons of Allied shipping. In disgust at the political trend he left military life, studied for the ministry and became pastor of a Berlin church. Disillusioned in his trust in Hitler he openly attacked Nazi principles and in 1937 was imprisoned and continued in custody for seven years. Upon his release he was found to be in poor health but he renewed the fight to depose from the ministry pastors having Nazi sympathies. Hitler greatly feared him and once said, 'It is Niemoeller or I.'

**Niepce, Joseph Nicéphore** (1765-1833),

French chemist, born at Châlons-sur-Saône. In 1827 he associated himself with Daguerre, and discovered the means of reproducing spontaneously images received in the camera, and out of this grew photography.

**Nietzsche, Friedrich Wilhelm** (1844-1900), German philosophic writer, was born at Röcken, near Lützen. There are, according to Nietzsche, two fundamental ethical types: on the one hand, the morality of slaves or the weak among mankind, who favor all the virtues that suit their weakness; on the other hand, the morality of the strong, of the masters, who stand above the common herd, and have no need of their base utilitarian virtues. Christian morality belongs to the former type. Thus *Spake Zarathustra*, and others of Nietzsche's works have been translated into English (1899, etc.).

**Nièvre**, central dep. of France, bordered on the w. by the Middle Loire. The soil is not very fertile, and the chief wealth lies in minerals and in forests. The department yields iron, coal, and kaolin, with manufactures of cutlery, hardware, and china. There exist remains of hundreds of Gallo-Roman forges. Area, 2,658 sq. m.; p. 260,502.

**Niger**, the third in length of the rivers of Africa, about 2,600 m. long, and with a basin of 584,000 sq. m. The main upper branch takes its rise only 150 m. from the w. coast of Africa. This, the Joliba, finally enters the Gulf of Guinea by a vast delta. The modern explorations of the river began with Mungo Park, who was drowned in the Busa rapids.

**Nigeria**, the British territory on the Lower Niger.) In 1884 the first definite territorial rights were acquired by the National African Company. In 1900 the rights of the company were transferred to the British crown, the whole British territory (400,000 sq. m.; p. 25,000,000) being divided into the two protectorates of Northern and Southern Nigeria. The coast region is low-lying, humid, and unhealthy. Farther inland the country becomes clothed with dense forest; while just below the confluence of the Niger and the Benue a line of hills marks the beginning of the interior plateau, which rises in parts to 2,500 ft. The plateau country is cultivated with millet and other grains, cotton, indigo, and leguminous plants, the *Bassia Parkii*, or 'shea butter-tree,' being also much grown. The climate of the plateau region is much drier, and healthier than the coast zone. The coast dwellers are typical pagan negroes, while the Fulani and Hausas of the north are

distinctly higher races. The seat of the government is at Lagos and for administrative purposes the British mandated territory of Cameroon is attached to Nigeria. The principal products are palm oil and kernels, rubber, cotton, and timber. Nigeria is the sixth largest producer of tin in the world.

**Night**, the interval between sunset and sunrise. At the equinoxes it is of twelve hours' duration all over the earth; it then lengthens in one hemisphere as it shortens in the other, until the solstices, when the process is reversed. Within the Arctic and Antarctic circles the night of mid-winter exceeds 24 hours, and the excess grows with latitude until a six-months' night is attained at the poles.

**Night-Blooming Plants** are plants whose flowers open or become fragrant as night draws in, closing, dying, or ceasing to yield fragrance at the approach of day. Most of these flowers are fertilized by moths or other insects of the night. Among the common examples are the large, white-flowered evening primrose (*Oenothera lamarckiana*), and the double white rocket (*Hesperis matronalis*), or damask violet.

**Nighthawk**, or **Bullbat**, an American bird (*Chordeiles virginianus*) of the nightjar family, common in summer throughout the United States and Southern Canada east of the Rocky Mountains. It is slightly larger than the whip-poor-will.

**Night-Heron**, one of a group of small, nocturnal herons, widely distributed over the globe. Two species are known in North America—the black-crowned (*Nycticorax nycticorax*), which is practically the same as the European night-heron, and the yellow-crowned (*Nyctanassa violacea*).



Nightingale.

**Nightingale** (*Dauhis luscinia*), a passerine bird famous for its beautiful song. It winters in Africa, as far south as Abyssinia and the Gold Coast, and breeds throughout Central Europe. In the British Isles it is found in

South and Midland England. The sexes are alike in plumage. The males sing by day and by night in fine weather, but the song has always attracted most attention at night. Another species (*D. Haqizi*) is found in Persia, and is the bulbul of Persian poets.

**Nightingale, Florence** (1820-1910), the pioneer of trained army nursing, was born in Florence. She went through a course of training at the Protestant Deaconesses' Institute at Kaiserswerth in Germany, and made a thorough study of hospital methods in England, France, Italy, Constantinople, and Alexandria. When the reports of the sufferings of the troops in the Crimea reached Eng-



Florence Nightingale.

land, she sailed (October, 1854) for Scutari with a staff of 38 volunteer nurses. There she toiled until the British troops left the town, in July, 1856. Her nightly rounds of the wards, so eagerly awaited by the soldiers, won for her the title of the 'Lady with the Lamp.' The feeling of the nation found expression in a gift of £50,000, with which Miss Nightingale founded a training home for nurses. She became general adviser on nursing organization and sanitary reforms throughout the civilized world. Her influence and example caused the founding of the Red Cross Society. She wrote: *Notes on Hospitals* (1859); *Notes on Nursing* (1860). See Richards's *Florence Nightingale* (new ed. 1909).

**Nightjar** or **Goatsucker**, a bird of the family Caprimulgidae. It has a short, broad beak, an enormous gape, large eyes, and a

loose, owl-like plumage. These birds are usually nocturnal in habits and migratory.

**Nightmare**, or **Incubus**, a disturbance of sleep, sometimes associated with a feeling of intolerable weight in the epigastrium and with intense terror. Nightmare may generally be traced to an error of diet, and is most apt to occur in those who have weak digestion, or who are in ill-health. See DREAMING.

**Night-Riders**, a popular name for bands of men, masked, armed, and operating at night, who at intervals since 1907 have terrorized certain sections of the Southern and Western United States. Their object has been to lessen the production or dictate the disposal of certain crops; especially tobacco and cotton. Their maximum number has been placed at 9,000 or 10,000. They first appeared in the Kentucky and Tennessee tobacco districts, and they have also operated in sections of Arkansas, Georgia, Ohio, Indiana, and Louisiana. In 1910, 8 Night-Riders were convicted on criminal charges. Since that time, outbreaks have been less frequent.

**Nightshade**, a name given to various plants, mostly belonging to the order Solanaceæ. The woody nightshade or bittersweet is *Solanum dulcamara* (see BITTERSWEET). Another common plant is the black nightshade (*S. nigrum*), which occurs on waste ground, the flowers being followed by black berries. The so-called deadly nightshade (*Atropa belladonna*) is occasionally cultivated. It is the source of the drug belladonna, and of the valuable alkaloid atropine. The common enchanter's nightshade, which generally grows as a weed in damp gardens, is a species of *Circæa* (*C. lutetiana*).

**Nihilism** is, in theory, complete individualism; a negation of responsibility to the state, to society, and to the church. In the 19th century it gave an aim to the forces of political and social discontent in Russia—the aim of destroying the existing government—by violent and underhand methods, if necessary. The practical ends for which they worked were freedom of the press and of speech, local self-government for the towns, religious equality, a democratic and permanent parliament, and the land for the people. See Stepaniak's *Nihilism as It Is* (1895); Turgenieff's novels; Milyoukov's *Russia* (1905).

**Niigata**, capital of Echigo province, Hon-do, Japan, 150 m. n.w. of Tokyo. Coarse lacquer ware is manufactured; there are deposits of coal and petroleum. It is noted for its apples and watermelons; p. 119,600.

**Nijinsky, Waslav** (1890- ). Recognized as the greatest dancer of the twentieth century. Born in Russia. In 1908 Nijinsky became a member of the Imperial Opera House of St. Petersburg.

All Europe came to love his dances, created by Michel Fokine: *Petrouchka*, *Pavillon d'Armide*, *Scheherazade*, *Carneval*, *L'Après-midi d'un Faun*. Stravinsky and Scriabin composed for him, and Bakst splashed his vivid colors on his stage settings. In 1919 he suffered a breakdown and since 1920 has been in a Swiss institution.

**Nijni-Novgorod**, or **Nizhni-Novgorod**, capital of the autonomous province of the same name in Russia, seat of one of the greatest of European fairs, 240 m. e.n.e. of Moscow, at junction of the rivers Oka and Volga. It is divided into two main parts—the permanent town, and the temporary or 'fair' town. The former is divided into the upper city and the lower city. The former of these (150 to 250 ft. above the Volga) contains the Kremlin, or citadel, and most of the historical buildings; the latter lies at the foot of the high ground. Nijni-Novgorod was founded in 1212, and became the capital of a separate principality in 1350. It was united to Moscow in 1392; p. 185,247.

**Nike**, in ancient Greek legend the goddess of victory, called Victoria by the Romans. In works of art Zeus and Athena are often represented as holding her in their hands. She carries a wreath or a palm, and has wings.

**Nikko**, tourist resort and place of pilgrimage, Hondo, Japan, in a lovely mountain district 2,000 ft. above sea-level. Its Buddhist and Shinto shrines are unrivalled for elaborate wood-carving and color-work.

**Nikopoli**, or **Nicopolis**, anc. tn., Bulgaria, on r. bk. of Danube. Here Sigismund of Hungary was defeated by the Turks in 1396; and near here the Russians defeated a Turkish fleet in 1829. In 1877 the Russians nearly destroyed the place; p. 6,000.

**Nile, Battle of the.** See **Aboukir**.

**Nile**, river of Africa. From time immemorial its source was a mystery. It is now known to have its farthest source in the Nyavolonga and the Akanyaru, headstreams of the River Kagera, which rises between 2° and 3° s., and enters the w. side of the Victoria Nyanza. After passing through this lake, the river proceeds n. as far as Gondokoro (5° n.), where it is joined by the Bahr-el-Ghazal and the Sobat from the Galla highlands; from this point to Khartum it is called the Bahr-el-Abiad, or White Nile. Here it is

joined by the Bahr-el-Azrek (Blue Nile), and the united stream flows on in a long, narrow valley to Cairo, where the delta begins, and thence to the Mediterranean Sea. The Nile is one of the three longest rivers in the world, being about 4,000 m. in length; and but for two great interruptions, it is navigable for its entire course. Between Wady Halfa and Khartum there are five cataracts, or rather series of rapids. The Libyan Desert lies to the w., and the Arabian and Nubian deserts to the e. of the river. Once every year the Nile overflows its banks, and deposits upon the land a black and very fertilizing mud, upon which the very existence of all the crops in Egypt depends. In 1770 Bruce discovered the sources of the Blue Nile in Lake Tana in Abyssinia. In 1858 the Victoria Nyanza was discovered by Speke, and in 1889 the Albert Edward Nyanza by Stanley. On the Nile in Egypt, is the great Assuan Dam (irrigation), and further up-stream on the Blue Nile in Sudan, is the Sennar Dam (irrigation).

**Niles, John Milton** (1787-1856), American politician, born at Windsor, Conn. In 1817 he founded and began to edit the *Hartford Times*.

**Nilgai**, or **Nyighau** (*Boselaphus tragocamelus*), an antelope which is confined to India.

**Nilgiri**, or **Neilgherry Hills** (i.e. Blue Mountains), an almost isolated plateau, at s. extremity of Deccan, Madras Presidency, India. It rises abruptly to the height of 6,500 ft., its highest peak, Mt. Dodabetta, reaching 8,760 ft.

**Nilometer**, ancient construction for measuring the height of the Nile. One constructed by Caliph Suleiman (715-717 A.D.) stands on the island of Roda, s. of Cairo, and consists of an octagonal pillar graduated to 17 cubits of 21.386 in., standing in a square well 16 ft. deep. When the river has risen 15  $\frac{2}{3}$  cubits, irrigation is begun.

**Nilsson, Christine** (1843-1921), Swedish soprano, born near Wexiö. Besides operatic engagements in St. Petersburg, Moscow, and Vienna, she made tours in the U. S., where she first appeared as a concert singer in 1870, and the following year in operatic rôles. She sang the part of Elsa in *Lohengrin* on its first production in London (1874) and was the creator of important rôles in various operas.

**Nimbus**. See **Aureole**, **Cloud**.

**Nimeguen**, **Nijmegen**, or **Nymwegen**, tn., Netherlands, prov. Gelderland. The principal church (1272) contains a fine mnu-

ment to Catherine of Bourbon (d. 1469). Here treaties of peace were signed between Spain, France, Austria, and the Netherlands (1678-9); p. 78,110.

**Nîmes**, chief tn. of dep. Gard, France, lies midway between Montpellier and Avignon, on the s.e. slopes of the Cevennes. It manufactures shawls, velvet-pile carpets, silks, wine and brandy. It possesses well-preserved monuments of Roman architecture. Its glory is its amphitheatre (?138-161 A.D.). The Maison Carrée was one of the most elegant Corinthian temples in the Roman world. The aqueduct of Pont du Gard, originally terminated in Nîmes; p. 84,661.

**Nimitz, Chester W.** (1885- ), admiral in the U. S. Navy, was born in Fredericksburg, Tex., and was graduated from Annapolis in 1905; commanded a submarine flotilla in 1912; in World War I was chief of staff to the Atlantic fleet's submarine force commander. He was assistant chief of the Bureau of Navigation, 1905-38 and chief of the Bureau, 1939; was made a rear admiral, 1938 and commander of Battleship Division 1 of the Battle Force, 1938-39. In late 1941, after the Japanese attack on Hawaii, he was promoted to admiral and made commander-in-chief of the Pacific Fleet. He chased the Japanese fleet from Pearl Harbor to Tokyo Bay and his skilful maneuvering of his own naval forces was a leading factor in winning the war. In October, 1945, he was awarded a Gold Star in lieu of a third Distinguished Service Medal. He had previously been promoted to fleet admiral in December 1944.

**Nimrod**, a son of Cush, is described in Genesis as a great hunter.

**Nimrod**, pen-name of Charles James Apperley.

**Nindemann, Wilhelm Friedrich** (1850-1911), German-American explorer. He came to the U. S. in 1867, and after some experience as a sailor, accompanied the *Polaris* expedition to the Arctic in July, 1872. He was one of the 19 members of the crew who drifted away from the vessel on an ice-floe in October of the following year and were rescued by the *Tigress* after 196 days of drifting. Nindemann was also a member of the crew of the *Jeannette* which sailed from San Francisco in July, 1879, for the Siberian Arctic, and after the crushing of that vessel in June, 1881, was one of the two survivors of De Long's boat party in the mouth of the Lena.

**Ninety-six**, a village in Abbeville co., S. C., so called because it was 96 m. from Fort

Prince George on Keowee river. A stockade was originally constructed as a defence against the Indians. In 1781 it was occupied and fortified by a force of 550 Tories which successfully resisted a superior force under Gen. Greene.

**Nineveh**, ancient capital of Assyrian empire, on e. bk. of Tigris, opposite the modern Mosul. Rehoboth-ir is supposed to be the Rêbit Ninua of the inscriptions, which was seemingly an extension of the city to the north-east. The ruins consist of the remains of a wall about 7 m. in circumference, broken next the Tigris by two large mounds or palace-platforms, Kuyunjik and Nebi-Yunus. The Northern palace, built by Assur-bani-pal, has yielded, among other things, the splendid series of hunting scenes now in the British Museum, and the largest collection of Assyrian inscriptions known. The date of the foundation of Nineveh is doubtful; but it must have been of considerable antiquity, dating probably from the beginning of the 3d millennium B.C.

**Ning-po**, city and treaty port in Che-kiang prov., China, 12 m. from the sea. Rice, cotton, varnish, oils, sepia, and bamboos are its chief products. Ning-po is noted for its wood-carving and embroideries, and has a high literary reputation. The Portuguese founded a settlement here in 1522, which was exterminated in 1545. The town was taken by the British in 1841, and occupied until May, 1842, when the port was opened to foreign trade; p. 219,000.

**Ninian, Saint** (d. 432?), one of Scotland's earliest apostles. Consecrated bishop to the western parts of Britain, he established his diocese at Whithorn in Galloway, and in 397 built there what is stated to have been the first stone church in Britain, the see of Galloway being known as 'Candida Casa'—i.e., white house (chapel). Ninian subsequently endeavored to convert the Southern Picts.

**Niobe**, in ancient Greek legend, was the wife of Amphion, king of Thebes. According to Homer's story, she was so proud of her 12 children that she scorned the goddess Leto, who had only given birth to Apollo and Artemis. To punish her they slew all her children, and the gods turned Niobe into a stone on Mt. Sipylus in Asia Minor.

**Niobium**, or **Columbium**, Nb or Cb, 94, a very rare metallic element, occurring chiefly in niobite. It forms an acidic oxide, Nb<sub>2</sub>O<sub>5</sub>, from which the salts known as niobates are derived.

**Niort**, tn., cap. of dep. Deux-Sèvres, France. Its nursery gardens and glove industry are famous. Niort contains a beautiful Gothic church (1491-1534), and an old castle in which Mme. de Maintenon was born; p. 27,721.

**Nipigon Lake**, in Ontario, Canada, 30 m. n.w. of Lake Superior. Area, 1,450 sq.m. It is studded with over a thousand islands.

**Nipissing, Lake** (or **Nepissing**), in Ontario, n.w. of Lake Huron, nearly midway between it and the Ottawa River. It is 50 m. long and 35 m. broad at its widest part, is very irregular in shape, and its shores are bold and rugged. Lake Nipissing is connected with Georgian Bay in Lake Huron by French River, whose navigation is rendered difficult by numerous rapids. There is a settlement of 400 people called Nipissing on the shores of South River and Lake Nipissing.

**Nippon**, or **Niphon**, a name for the Japanese empire, but wrongly limited by foreigners to the main island, Hondo. Dai Nippon is 'Great Japan.' See JAPAN.

**NIRA**, National Industrial Recovery Act. A U. S. New Deal agency.

**NLRB**, the board set up to implement the National Labor Relations Act (1935).

**Nirvāna** is that perfect condition which a Buddhist attains when, having conquered his passions, he can view with indifference the world, its sin, and its turmoil—a state of perfect peace and rest. See BUDDHISM.

**Nisei** are those individuals of Japanese blood who are citizens of the U. S.

**Nishapur**, town, Khorassan, n.e. Persia, with turquoise mines. In the town is the tomb of Omar Khayyām; p. 20,000.

**Nisibis**, also called **Antiochia Mygdoniæ**, an ancient city of Mesopotamia. It figured in the wars of Rome with the Parthians and the Persians, but was finally captured by the Persians in the reign of Julian (363 A.D.).

**Nisi Prius**. In the United States, a term to describe courts for trial of civil cases before a jury.

**Nitre**, **Niter**, or **Saltpetre**, KNO<sub>3</sub>, occurs as an incrustation of the soil in hot and dry climates. Chile nitre is sodium nitrate. See further under POTASSIUM.

**Nitric Acid**, or **Aqua Fortis**. See Nitrogen.

**Nitric Oxide**. See Nitrogen.

**Nitrification**, the process by which nitrogenous organic matter is oxidized to nitrous and nitric acids. It is brought about by the agency of a minute bacillus. The process oc-

curs in every fertile soil, and is intimately connected with its crop-producing power. See NITROGEN; FERTILIZERS.

**Nitriles.** the cyanides of the alkyl radicles, constituted  $R-C\equiv N$ . Nitriles are ethereal-smelling liquids which when hydrolyzed yield an acid of same carbon content and ammonia. See AMIDES.

**Nitrites.** See Nitrogen.

**Nitro-benzene**, oil of mirbane.  $C_6H_5NO_2$ , is prepared by slowly adding ten parts benzene ( $C_6H_6$ ) to a mixture of 13 parts concentrated nitric acid, with 18 parts concentrated sulphuric acid, contained in large, well-cooled vessels. After the action the acids are separated from the oily layer, which, after washing, is then distilled. It is used to scent soaps, but most of it is converted to aniline.

**Nitro-cellulose**, the product of the action of nitric acid on cellulose. Several products are produced, according to the concentration of the acid, none of which, however, are really 'nitro' derivatives, but are rather the nitric acid esters, or nitrates, of cellulose, which is of an alcoholic nature, containing six hydroxyl groups. See GUN-COTTON; COLLOIDION; CELLULOID.

**Nitro-compounds** are hydrocarbon derivatives containing  $-NO_2$  groups. They differ much according as to whether they are derived from the fatty or aromatic series; the latter yields by far the most important nitro-bodies.

**Nitrogen**, N, 14.01, a gaseous element that occurs free in the atmosphere, of which it forms about four-fifths. All living things contain it as an essential ingredient, and it also occurs largely in the nitrates of sodium and potassium, and in ammonia. Nitrogen may be prepared from the air by combining the oxygen with which it is mixed with some easily oxidizable substance. It may also be distilled from liquid air, as its boiling point is lower than that of oxygen. Nitrogen is a colorless, odorless gas. Chemically, nitrogen is comparatively inert, not readily uniting with other elements. It is a component of a number of compounds of the highest natural and industrial importance. Of these, the hydride, ammonia,  $NH_3$ , is one of the chief, both in itself, its salts, and the derivatives in which organic radicals replace more or less of the hydrogen amines.

OXIDES OF NITROGEN and their derivatives are also extremely important. They are five in number—*viz.*, nitrous oxide  $N_2O$ ; nitric oxide,  $N_2O_3(NO)$ ; nitrous anhydride,  $N_2O_3$ ;

nitrogen peroxide,  $NO_2$  or  $N_2O_4$ ; and nitric anhydride,  $N_2O_5$ . These oxides are also termed nitrogen mono-, di-, tri-, tetra-, and penta-oxide. See CHEMISTRY. Nitric acid is largely employed in the preparation of nitric esters, such as 'nitro-cellulose' and 'nitro-glycerin' for use as explosives, and for the preparation of true nitro-derivatives, such as nitro-benzene. The acid is also used for etching and engraving, and for separating alloys of gold and silver. In a diluted state it is used in medicine. For the particular nitrates, see the articles dealing with the various metals of which they are salts.

**Fixation of Nitrogen.**—Nitrogen being an essential constituent of all living matter, it must be supplied to the soil in a form assimilable by plants, which are incapable of taking it up directly. Since 1860 the extensive nitrate beds of Chile have been the principal world source of such a compound, yielding 3,166,000 tons in 1916. The further duration of this supply is estimated between 50 and 300 years. Hence has arisen a vital chemical problem of universal human concern. See CHEMISTRY; FERTILIZERS. Calcium carbide heated ( $900^\circ C.$ ) in the presence of calcium fluoride will react with nitrogen to form calcium cyanamide, useful as a fertilizer and a substance from which other useful compounds are readily derived in preparation of dyes and explosives.

**Nitroglycerin** (more correctly **Glycerol Trinitrate**, known also as *Glonoïn* or *Glonoïn Oil*), has the composition  $C_3H_5(O.NO_2)_3$ , and is glycerin ( $C_3H_5(OH)_3$ ) in which three atoms of hydrogen have been replaced by three 'nitro groups' ( $NO_2$ ). Nitroglycerin is manufactured on a large scale for commercial purposes. It is never employed by itself as an explosive, but is usually mixed with kieselguhr to form dynamite, or with guncotton to form blasting gelatin. (See EXPLOSIVES.)

Nitroglycerin is also used in medicine, in one-per-cent. alcoholic solution, as a powerful heart stimulant.

**Nitrous Ether**, or **Ethyl Nitrite**,  $C_2H_5NO$ , is a very volatile ether, with an agreeable apple odor, and having a specific gravity of .900. In itself it is of little importance, but on account of its relation to the *Sweet Spirits of Nitre*, or *spirit of nitrous ether* (a mixture of nitrous ether and alcohol in variable proportions), is one of the most important drugs.

**Niue**, or **Savage**, a coral island, 36 sq. m. in area, in the South Pacific ocean. It was annexed to New Zealand in June, 1901 and taken under British protection in 1910. Copra

and straw hats are exported; population 4,000.

**Nivelle, Robert Georges** (1856-1924), French soldier, was born at Tulle, in the department of Corrèze, of French and English parentage. He distinguished himself in the Battles of the Marne and Aisne, and on Oct. 24, 1914, was promoted to general of brigade. After checking the sudden Teuton drive on Soissons, he was placed in command of the Sixty-first Infantry Division, and on Dec. 23, 1915, was made commander of the Third Army Corps. General Nivelle was called to Verdun in March, 1916, where he succeeded General Pétain in command of the defences at that place in May, and retook the fortresses of Vaux and Douaumont in October. In December, 1916, he was appointed commander-in-chief of the armies of the north and northeast. Toward the end of the disastrous Allied offensive of 1917 the French army under Nivelle's command mutinied, and he was succeeded by Marshal Pétain. The secret of the mutiny was kept until after the end of the war.

**Nivelles**, town, Brabant province, Belgium, on the River Thines. Its fine Romanesque church (1045) contains the relics of Pepin's daughter, St. Gertrude. It has railway workshops, and manufactures of cotton, paper, parchment, lace, etc.; p. 12,328.

**Nix and Nixie**, male and female water spirits in Norse mythology.

**Nixon, Lewis** (1861-1940), American naval architect, born in Leesburg, Va. In 1884 he was transferred to the Construction Corps of the Navy, and designed (1890) the battleships *Oregon*, *Indiana*, and *Massachusetts*. In 1898 he was appointed president of the East River Bridge Commission, and consulting naval architect to the Cramp Company. In 1902 he succeeded Richard Croker as leader of the Tammany Hall organization, but resigned in a few months. He was appointed by President Taft delegate to the Fourth Pan-American Conference at Buenos Ayres, and to the Chilean Centenary (1910). In 1914-15 he was commissioner of public works for the Borough of Richmond, New York.

**Nizami** (1141-1202), Persian poet, was born at Tafrish, and resided at Genje, or Ganjah. He is one of the seven great poets of Persia, and the author of several famous poems known as 'The five Treasures of Nizami.' Consult W. Bacher's *Nizami* (Eng. trans. by S. Robinson).

**Nizhni-Novgorod**. See *Nijni-Novgorod*.

**Njörd**, the sea god in Scandinavian myth-

ology; not a bodily impersonation like Neptune, but the spirit of water and air. See MYTHOLOGY.

**Noah**, the hero of the Deluge, was the son of Lamech, and the father of Shem, Ham, and Japheth. See DELUGE.

**Noah, Book of**, a Jewish apocalyptic writing which, lost as an independent work, has been largely incorporated in the Book of Enoch and the Book of Jubilees, and in a later Hebrew work known as the Book of Noah.

**Noailles**, a noble family of France.

**ANNE JULES, DUC DE NOAILLES** (1650-1708), is best remembered by the share that he took in suppressing with great severity the rising of the Camisards, the Protestants of the Cevennes.

**ADRIEN MAURICE, DUC DE NOAILLES** and **MARSHAL OF FRANCE** (1678-1766), son of the above, was in the Council of Finances, and was dismissed by the Duke of Orléans for his opposition to the schemes of the adventurer Law. In June, 1743, he was defeated by the Anglo-Hanoverian army at Dettingen.

**LOUIS ANTOINE** (1651-1729) was made archbishop of Paris in 1695 by the favor of Madame de Maintenon, and in 1700 was made a cardinal. He was powerful in the councils of the regent, and used his authority against the Jesuits.

**PHILIPPE, COMTE DE NOAILLES** (1715-94), won distinction as a soldier in several campaigns.

**LOUIS MARIE, VICOMTE DE NOAILLES** (1756-1804), fought for the American colonies in the war of Independence, and upon the outbreak of the Revolution it was on his proposal that all feudal rights and privileges were abolished (Aug. 4, 1789).

**Nobel, Alfred Bernard** (1833-96), Swedish inventor and philanthropist, was born in Stockholm. In 1850-54 he was in the United States, where he studied mechanical engineering under John Ericsson. From the manufacture of dynamite, his inventions of smokeless powder and artificial gutta percha, and from numerous other inventions he accumulated a large fortune. He gave liberally to charitable enterprises, and at his death founded the series of Nobel Prizes.

**Nobel Prizes**, a series of five annual prizes awarded from a fund of \$9,000,000, bequeathed for the purpose by Alfred B. Nobel, for important discoveries or inventions in physics, chemistry, medicine, or physiology, for distinctive work in idealistic literature, and for important services in the interest of

peace. In physics and chemistry the prizes are awarded by the Swedish Academy of Science; in medicine, by the Caroline Institute in Stockholm; in literature, by the Swedish Academy in Stockholm; in peace, by a committee of five elected by the Norwegian Storting. The work of the Nobel Institute began in 1900. Four members of the board, exclusively Swedes, are elected for two years by deputies of the four institutions named, and a fifth member is chosen by the government. The prizes average \$40,000 each, and, with diplomas and gold medals, are awarded annually on Dec. 10. The international character of these awards is well illustrated by the prize for idealistic literature, which has gone at various times to representatives of Spain, England, Norway, Belgium, Germany, France, Italy, Poland, Sweden, India, Switzerland, Denmark, Ireland and the United States.

**Nobile, Umberto** (1885- ), Italian engineer and explorer. While serving on the national railways he drafted plans for an airship which the government commissioned him to build—the *Norge*. This craft in 1926 carried the Amundsen-Ellsworth Expedition, with Nobile as pilot, from Rome to the North Pole and on to Teller, Alaska. Nobile decided to fit out an all-Italian Arctic expedition, built a larger airship—*Italia*—in which, with 15 others, he flew over the North Pole and was wrecked on the way back (May 25, 1928). The tragedy cost 14 lives, for which Nobile was blamed. Nobile, in 1931, undertook a four-year contract building dirigibles in Soviet Russia, having resigned as a general in the Italian Army.

**Nobility**, that distinction of rank and civil society which raises a man above the condition of the mass of the people. The origin of the feudal aristocracy of Europe is in part connected with the accidents which influenced the division of conquered lands among the leaders and warriors of the nations that overthrew the Roman Empire. Under the feeble successors of Charlemagne, the nobles of the empire encroached more and more on the royal authority; and by the end of the ninth century the Carolingian empire had been parcelled into separate and independent principalities, under the dominion of powerful nobles against whom, in Germany, the crown never recovered its power. In France, however, the royal authority gradually revived under the Capetians, the great fiefs of the higher nobility being one by one absorbed by

the crown. In England, where the subjection of the feudal aristocracy to the crown always was and continued to be a reality, the resistance of the nobles to the royal encroachments was the means of rearing the great fabric of constitutional liberty. After the introduction of heraldry, and its reduction to a system, the possession of a coat-of-arms was a recognized distinction between the noble and the plebeian. In England the words noble and nobility are restricted to the five ranks of the peerage which are comprised by duke, marquis, earl, viscount, and baron (in the restricted significance of the word), who are members of the Upper House of Parliament (House of Lords). (See **PEERAGE**). In France the title of Duke was subject to strict rule, but many titles of Marquis and Count, believed to be pure assumptions, were recognized by the courtesy of society. All marquises and viscounts are of pre-Revolution titles, none having been created in more recent times. The nobility of Spain boasts of a special antiquity and purity of blood, a descent from warriors and conquerors alone 'Hidalgo' is a term which implies gentility or nobility; the hidalgo alone has in strictness a right to the title 'Don.' The higher nobility are styled *Grandeess*; the class of nobility below them are called 'Titulados.'

**Noble**, a coin, manufactured of gold, in the reign of Edward III.

**Noble, Alfred** (1844-1914), American civil engineer, was born in Livonia, Mich. From 1902 to 1909 he was chief engineer of the East River division of the Pennsylvania Railroad's extensive improvements in New York City. He was also consulting engineer of the Galveston tidal works and the first New York subway system. In 1903 he was president of the American Society of Civil Engineers; in 1910 was awarded the John Fritz medal, and in 1912 the Cresson medal of the Franklin Institute.

**Noctiluca**, a genus of flagellate Protozoa, whose members are the chief source of phosphorescence in northern seas. It has a well developed flagellum. The light is said to be evolved from the layer of protoplasm which underlies the cuticle.

**Noctuidæ**, a family of moths, known as **OWLETS** or **MOTH MILLERS**, which fly chiefly by night. See **MOTHS**.

**Nocturn**. In the Roman Breviary the Psalms are divided into parts called nocturns, which were originally recited at midnight. They now form a part of matins, and are



introduced at about the same place as the Psalms in the Morning Prayer of the Anglican Prayer Book. See **BREVIARY**.

**Nocturne** (Latin *nocturnus*, nightly), a musical composition of a light, sentimental nature. While it owes its origin to John Field, its chief exponent was Chopin. The term has also been used by many noted artists, e.g., Whistler and Turner, to describe their night scenes. See **MUSIC**.

**Noddy** (*Anous*), a genus of birds of the family, Laridae, differing from terns, in having the bill slightly angular, being in this regard somewhat similar to gulls, and in having a wedge-shaped, rather than a forked, tail.

**Nodes**, in botany. See **STEM**.

**Nodes**, in astronomy, the two points in which the orbit of a planet intersects the plane of the ecliptic, the one through which the planet passes from the south to the north side of the ecliptic being called the *ascending node*, and the other the *descending* or *setting node*.

**Noetus** (fl. c. 200 A.D.), a native of Smyrna, who promulgated the doctrine that the one God and Father could of His own free will be and do all things. See **MONARCHISM**.

**Nogi, Kiten, Count** (1849-1912), Japanese soldier. In the Chino-Japanese War (1894-5) he was commander of a brigade at the battles of Kinchow and Port Arthur. In 1904, at the outbreak of the Russo-Japanese War, having been made a general, he was successful in capturing Port Arthur, Jan. 1, 1905. He commanded a corps at the Battle of Mukden. (See **RUSO-JAPANESE WAR**). On Sept. 13, 1912, in bereavement for the death of the Emperor Mutushito, Nogi and his wife committed *hara-kiri*.

**Noguchi, Hideyo** (1876-1928), Japanese physician, prominent in medical research, went to the United States to study at the University of Pennsylvania (1901-03). Thereafter he was connected in turn with the Statens Serums Institute, Copenhagen, the Carnegie Institute in Washington, and the Rockefeller Institute in New York. He is best known for his discovery of the trachoma bacillus and for his work on syphilis and yellow fever. While working on this study in Accra, British West Africa, he contracted the disease and died.

**Nolle Prosequi**, a term in English law. When a criminal trial has been begun it can only be stayed by entering a *nolle prosequi*—i.e., by entering on the record a statement that the prosecutor will proceed no further.

In the U. S. it may be entered in a civil as well as in a criminal case.

**Nom de Plume**. See **Pseudonyms**.

**Nome**, city on the south side of Seward Peninsula, Alaska. Gold was discovered in the beach sands of the coast near here in 1898, and richer deposits were subsequently found in the river beds, notably in that of the Snake River. Deposits of tin, copper, bismuth, and galena also have been found in the district. Of late years the sands have been worked out, but Nome has produced more than \$35,000,000 in gold dust. The city was first settled in 1900 and called Anvil City. The population, which was about 20,000 in 1900, had dwindled to 1,213 in 1930. In October, 1913, the town was almost destroyed by a storm and in 1934 it had a disastrous fire.

**Nome, Cape**, is situated on the s. shore of Seward Peninsula.

**Nomenclature**, the systematic naming of things in any art or science or any branch of science, as in biology or chemistry. Cesalpino in 1583, and Tournefort in 1700, published systems of classification, but Linnæus in his *Species Plantarum* (1753) laid the basis for our present binomial system in the sciences.

**Nominalism**, the name of one of the rival theories in the mediæval controversy as to the reality of universals is known. According to nominalism, only the individual is real. Its more moderate form is known as Conceptualism. See **SCHOLASTICISM**.

**Nomura, Kichisaburo**, Japanese admiral, ambassador to the U. S. With Saburo Kurusu, he carried on (Dec. 1941) peace conferences at Washington while his government prepared its attack in the Pacific.

**Nonæ**, or the **Nones**, in the ancient Roman calendar the ninth day (according to the Roman practice of counting inclusively) from the ides. As they reckoned backward, the nones fell on the fifth day of each month, except in March, May, July, and October, when the ides were on the fifteenth, and the nones accordingly on the seventh.

**Non Assumpsit**, one of the forms of denial in an action on contract at Common Law. It denied the contract and left the issue to the jury.

**Non-commissioned Officers**, in the U. S. Army, are sergeants and corporals holding office by virtue of appointment of the regimental or artillery district commander, who issues to each a warrant in lieu of a commission. The non-commissioned officers of the Marine Corps are first sergeant, sergeant

major, quartermaster, and gunnery sergeants, sergeants, and corporals. See ARMY OF THE UNITED STATES.

**Non Compos Mentis**, a term used to indicate all forms of want of understanding recognized at law. It includes madness and lack of sound mind arising from delirium, drunkenness, disease, or any other cause.

**Nonconformity**, the avowed and systematic renunciation of the worship and discipline of a church established by law. This term is usually used in connection with its English application to those who hold themselves aloof from the Church of England, generally known as nonconformists; in Scotland the ordinary name is dissenter.

**Non Est Factum**, a plea used at common law is an action of debt based upon an instrument in writing. It denies the existence of the instrument upon which the plaintiff relies in bringing the action, or denies it as the defendant's deed.

**Non Feasance**, a legal term denoting that something which should have been done in legal contemplation has not been done, as failure to comply with some legislative requirement. A tort may be committed by non feasance or omission as well as by a wrongful act.

**Non-Importation**, a policy adopted several times in America as a retaliation against measures of the British Government, the non-importation of British merchandise being agreed upon, or, as in one case, prescribed by Act of Congress. During the Stamp Act excitement (1765) the Whigs in various colonies agreed to refrain from importing British goods; this agreement was renewed after the passage by the British Parliament of the Townshend Acts of 1767, and by the close of 1769, all of the original thirteen colonies had pledged themselves to carry out the policy of non-importation. The contest between the United States and Great Britain regarding England's 'right of search' of American vessels for deserters from the British navy (see WAR OF 1812) led to a revival of the non-importation policy. An act of Congress of April 18, 1806, prohibited the importation after Nov. 15 of certain articles from Great Britain or any of her possessions, but on Dec. 19 the act was suspended until July 1, 1807; and subsequently the Embargo (December, 1809) and the Non-Intercourse Act (March, 1809) in which there was a modified non-importation clause, took its place.

**Non-Intercourse Act**, an act of the U. S. Congress, which became a law March 1, 1809,

and which superseded the Non-Importation Act of 1806 and (in large part) the Embargo of 1807, its passage being due primarily to the bitter opposition in New England to this latter measure. The act prohibited all commercial intercourse between the United States and Great Britain and France and the importation (after May 20) of all British or French goods, such goods, if imported, to be subject to forfeiture and the importer to be heavily penalized; and forbade the entrance into the ports of the United States, after the passage of the act, of public vessels of Great Britain and France, and, after May 20, of British and French private vessels.

**Non-Metals**, in chemistry, a group of elements not included in the metals. They are in general brittle, devoid of the lustre of metals, are poor conductors of heat and electricity; form oxides that with water yield acids, are set free at the anode in electrolysis, and readily united with almost all the other elements. The most important are argon, boron, bromine, carbon, chloride, fluorine, helium, hydrogen, iodine, nitrogen, oxygen, phosphorus, selenium, silicon, and sulphur.

**Non-Partisan League**, a political organization of farmers of the Middle Western United States, especially North Dakota, representing a protest against the failure of the regular political parties to carry out certain measures demanded by the voters at the polls, especially the erection of State-owned elevators and terminal markets. The League was organized in 1915, with A. C. Townly as president and it made its entrance into State politics in North Dakota in 1916. After winning victories in the State elections of that year, it went into other States of the West and Middle West, exerting for a time considerable influence but gradually disintegrating as an organization while the Farmer-Labor party in Minnesota and other party and non-partisan groups took its place.

**Nonsuit**, a judgment rendered against a plaintiff in an action when he unreasonably refuses or neglects to proceed with the trial, or where, after the trial has commenced, he is unable to make out a *prima facie* case. Before trial plaintiff may have a voluntary nonsuit at any time, but after he has put in his evidence, it is in the discretion of the court to grant or refuse such an application. In some cases this is accomplished at the trial by the withdrawal of a juror. A nonsuit is not a bar to another action upon the same facts, as it is not a determination of the is-

sues in the case. If a trial has proceeded to verdict, the case becomes *res adjudicata*, and a nonsuit cannot then be permitted.

**Noonivak**, island, Bering Sea, off Cape Vancouver, Alaska. It is about 60 m. long and 30 m. wide, and is inhabited by Eskimos.

**Nootka**, one of the two chief divisions of the Wakashan linguistic stock of North American Indians, the other group being known as the Kwakiutl. Like all Indians of the North Pacific coast, the Nootka dwell along the shore, and are bold and daring sailors. Characteristic are the religious ceremonies in the form of sacred dramas, and a peculiar lottery system known as the potlatch.

**Norbert, Saint** (1082-1134), founder of the religious order, the Premonstratensians, was born in Xanten, near Cleves. He was canonized in 1582 by Gregory XIII.

**Nord**, department of Northeastern France, lying along the Belgian frontier, and having an area of 2,228 sq. m. The principal rivers are the Scheldt, Lys, and tributaries of the Meuse and Seine. The soil is fertile and extensively cultivated, while the department is one of the most densely populated of France. Flax, cereals, sugar-beets, and potatoes are raised; fisheries are important; and the greatest coal fields of France center around Valenciennes. The principal industries are manufactures of textiles, machinery, glass, tobacco, porcelain, and sugar. Lille (the capital), Cambrai, Roubaix, Dunkirk, and Valenciennes are the chief cities. Nord was the scene of severe fighting during World War I; p. 1,969, 182.

**Nordeau, Max Simon** (1849-1923), German author, born in Budapest, ed. Hungary and France; wrote historical and philosophical works, also dramas and novels; best known work, *Degeneration* (1892).

**Nordenskiöld, Nils Adolf Erik, Baron** (1832-1901), Swedish geologist and Arctic explorer, was born in Helsingfors, Finland. From 1857 Sweden became his adopted country. In 1858 he was a member of Torell's expedition to Spitzbergen; he led an expedition to the North Sea islands in 1868, pushing his vessel, the *Sofia*, as far north as lat. 81° 42' N. In 1875 and 1876 he made voyages to the Yenisei, Siberia, and in June, 1878, set sail in the *Vega*, returning on April 24, 1880, after having circumnavigated Eurasia, thus accomplishing the Northeast Passage. Consult *The Arctic Voyages of Adolph Erik Nordenskiöld*, edited by Alexander Leslie.

**Nordenskiöld, Nils Otto Gustaf** (1859-1928), Swedish scientist and explorer, a nephew of Baron Nordenskiöld, was born in Sjögelö, Smaland. In 1895-7 he penetrated into the unknown interior of Tierra del Fuego, and visited Chile; in 1900 he accompanied Amdrup to East Greenland; and in 1901 he conducted a Swedish expedition to Louis Philippe Land in the Antarctic. In 1904-5 he made an expedition to the Andes, penetrated the northern forests of Bolivia, and studied the tribes of the practically unknown districts along the headwater tributaries of the Amazon.

**Norderney**, the largest of the East Frisian Islands, belonging to the province of Hanover, and lying in the North Sea, off the coast of Germany. It is about 8 m. long, 1½ m. wide, and has an area of 8 sq. m. The village, a popular bathing resort situated at the southwestern end of the island, is visited annually by thousands of people; p. about 4,000.

**Nordhoff, Charles** (1830-1901), American journalist and author, was born in Erwitte, Westphalia, Germany. He was taken to the United States by his parents in 1835, received a common school education in Cincinnati, O., and subsequently worked there as a printer. From 1857 to 1861 he was connected with the Harper publications, and from 1861 to 1871 was a member of the staff of the New York *Evening Post*. He was for a time associated with the New York *Tribune*; devoted two years to travel in the West and the Pacific; and in 1874 became Washington correspondent of the New York *Herald*, with which paper he was associated until his death.

**Nordica (Norton), Lillian** (1857-1914), American operatic singer, was born in Farmington, Me. After studying music at the New England Conservatory in Boston, she was engaged, in 1878, for a concert tour of Europe, in the course of which she sang at the Crystal Palace, London, and at the Trocadero in Paris. After further study under San Giovanni in Milan, she made her début in 1880 in *La Traviata* at Brescia, Italy. During the next few years she sang in Germany, Russia, and France, her chief rôles being in *Faust*, *Robert le Diable*, *Rigoletto*, *Lucia*, *L'Africaine*, *Aïda*, *Les Huguenots*, and *Don Giovanni*. After 1893 she appeared chiefly in Wagnerian opera, having the distinction of appearing at Bayreuth (1894). As a member of the New York Metropolitan Opera House company for several seasons she appeared as

Isolde, Elsa, Brünnhilde, Elisabeth, and Kundry. Her voice was a pure soprano of exceptional range and great power.

**Norfolk**, a maritime c. in the e. of England with an area of 1,308,439 acres. The surface is generally an undulating plain, the coast being low and flat and, for the most part, bordered by low cliffs or sand dunes. Off Yarmouth a dangerous sandbank shelters the 'roads,' in which the ships can find safe anchorage. The Broads, between Norwich and the sea, are a characteristic feature. Norfolk is one of the chief wheat-growing counties, and barley, oats, turnips, and mangold, as well as small fruits, are largely cultivated. Dairy farming is extensively carried on and fisheries are important. Norfolk is famous for its many interesting churches and abbeys. Sandringham, the country residence of the Queen-Mother Alexandra, is in the n.w.; p. 504,277.

**Norfolk**, second largest city of Virginia, and a port of entry, Norfolk co., is situated on the Elizabeth River, an arm of Chesapeake Bay. There is water connection with the Tidewater terminals of the Chesapeake and Ohio Railway at Newport News, and with the southern terminals of the Pennsylvania Railroad at Cape Charles. The Albemarle and Chesapeake (Free) and the Dismal Swamp canals, as well as many steamship lines, afford additional means of communication with inland cities and with the principal ports of the United States, the West Indies, the Orient, and Europe. The Norfolk Navy Yard is situated at Portsmouth, across the Elizabeth River, and at Sewall's Point is located the U. S. Naval Operating Base, comprising an area of 1,000 acres and having accommodations for 14,000 men. Among the chief buildings are the U. S. Custom House, Post Office, City Hall, U. S. Public Health Service Hospital, Naval Hospital, St. Vincent's Hospital, Protestant Hospital, Public Library, and historic St. Paul's Church, which was erected in 1737, and was struck during the bombardment in 1776. Norfolk, the chief seaport of Virginia, and a leading export port of the United States, carries on an extensive commerce. Its harbor is large and commodious, having a channel 40 ft. deep. With Portsmouth and Newport News it constitutes a Federal customs district. One of the largest coaling stations in the world, handling over 20,000,000 tons annually, is located at Hampton Roads (Norfolk and Newport News). Leading manufacturing industries are the grading, roasting, cleaning,

and shelling of peanuts, and the manufacture of lumber and planing-mill products, vegetable oils, cotton products, paper boxes, coal briquets, glass, fertilizer and chemicals. The city operates the Municipal Union Terminal through which all railroads enter the port on an equal basis.

The site of Norfolk originally consisted of fifty acres purchased by the General Assembly of the Virginia Colony in 1682, and in that year a government was formed that the town might become a leading station for receiving, storing, and selling tobacco. Within a few years a thriving trade was established and in 1736 George II. declared the settlement a borough. During the Revolutionary War, Lord Dunmore established the British fleet there. On Dec. 9, 1775, Lord Dunmore's troops suffered defeat at Great Bridge at the hands of the Virginia sharpshooters, and in revenge the British bombarded and fired the town, destroying nine-tenths of the buildings. In January, 1880, a Federal navy yard was established there. During the Civil War Norfolk was the scene of considerable fighting, the Confederates holding the Navy Yard while the Union forces were in command of Fort Monroe. The city charter dates from 1845; p. 144,332.

**Norfolk Island**, a British island under the jurisdiction of New South Wales, situated in the Pacific Ocean, about 1,100 m. n.e. of Sydney, and comprising an area of 13 sq. m. Whaling, agriculture, and herding are the chief occupations. Discovered in 1774 by Captain Cook, the island was used as a penal station by New South Wales and Tasmania until 1855; p. about 1,000.

**Normal College of the City of New York**, former name of Hunter College, established in 1870, under the control of the New York Board of Education, for the higher education of women.

**Normal Schools** (from *norma*, a rule), schools for the professional training of teachers, especially for the elementary schools. The idea of a special professional school for teachers dates back at least to the sixteenth century, when Richard Mulcaster of London suggested the organization of a teachers' department in the universities (1561). The Jesuit order, founded in 1540, provided for the regular professional, as well as academic, instruction of its future teaching staff, and shortly after the final formulation of its *Ratio Studiorum* in 1599, special schools were designated by the order as normal schools. The first school for the training

of elementary teachers was established at Rheims by La Salle in 1681. In America the principal means for the training of teachers previous to the middle of the 19th century was the academy. In 1823 the Rev. Samuel Hall opened in Concord, Vt., what was probably the first private normal school in the United States, and in the same year a private school for the training of teachers was opened in Massachusetts by James G. Carter. In the meantime the way was being prepared for the public normal school. In 1839, as a result of the work of Charles Brooks, Carter, Horace Mann, and others, the first public normal school in America was opened in Lexington. In 1844 New York established the State Normal School at Albany, though for a third of a century more the State continued its plan, adopted in 1835, of subsidizing the academies for this purpose. Connecticut established a State normal school in 1850, Michigan in 1852, Illinois in 1856, Pennsylvania in 1857, and the other States followed. All the leading universities of the country now maintain departments of education, and there are some few normal colleges, as Teachers College in New York City, which undertake to prepare teachers for secondary as well as elementary schools, and which grant degrees in pedagogy. In most States graduation from a State normal school carries with it the right to teach in that State, though this often rests with a State board superior to the normal school officials. Summer Schools for teachers have also large enrollment.

**Norman, Sir Henry** (1858-1939), English author and traveller, was born in Leicester. After being graduated from Harvard University he became prominent in the public agitation for the national preservation of Niagara Falls. In 1886 he became a member of the staff of the *Pall Mall Gazette*, passing in 1892 to the editorship of the *Daily Chronicle*, from which he resigned in 1899. In 1902 he founded the (English) *World's Work*. He travelled and explored in the United States, Russia, Siberia, Central Asia, Korea, China, Japan, Siam, the Malay Peninsula, Egypt, and the Balkans.

**Norman Architecture.** See **Architecture**.

**Norman Conquest**, of England by William of Normandy, was begun in 1066 by the victory of Senlac or Hastings, and was completed in 1071, when William took Ely and Hereward the Wake made peace. After the conquest the English Church was reformed

and reorganized; the connection between England and other European lands was strengthened, foreign trade expanded, and a great advance was made in literature, architecture, learning, and arts. Improvements took place in building and the art of war, and changes were effected in the language of the land. See **ENGLAND AND WALES, History**.

**Normandy**, former province of France, bordering on the English Channel, and including the present departments of Seine-Inférieure, Eure, Orne, Calvados, and La Manche. It was divided into Upper Normandy, containing Rouen, the former and present capital, and Lower Normandy. The chief cities are Rouen, Dieppe, Havre, Caen Lisieux, and Cherbourg. Normandy is famous for its cathedrals, its castles and abbeys, and the memorials of its early history.

In 911 the treaty of St. Clair-sur-Epte, between Charles the Simple and Rollo the Northman, proved the foundation of the duchy of Normandy. After the Norman conquest (1066) Normandy remained closely connected with England, but was conquered by the French king, Philip Augustus, in the reign of John. By the treaty of Paris in 1258 Henry III. of England acquiesced in the loss of Normandy. In the reign of Henry V., Normandy was again conquered by the English; but after his death it was reconquered by the French.

**Norman French**, a French dialect which developed in Normandy and was introduced into England at the time of the Conquest. It was the official language of justice, of government, and of schools, and might reasonably have been expected to supersede Anglo-Saxon though such was not the case. As the two races became more and more closely blended, the Norman language lost ground. After the 14th century it was used only by the aristocratic and literary classes, and it gradually disappeared. Before this happened, however, it had thoroughly permeated and enriched the Anglo-Saxon speech.

**Norns**, in Scandinavian mythology the three goddesses of fate, Urd, the past; Verdandi, the present; and Skuld, the future. Their duties were to weave the web of fate, daily to sprinkle the sacred tree Yggdrasil with water from the Urdar fountain, and to put fresh clay around its roots to keep it green and healthy. Two of the Norns were said to be beneficent, but the third, Skuld, was relentless, often tearing the web to pieces and scattering the pieces far and wide.

**Norris, Charles Gilman** (1881-1945), Am-

erican author, was born in Chicago. He married in 1909 Kathleen Thompson, now a well-known author. He became assistant editor of *Country Life in America*, 1903; of *Sunset Magazine*, 1905; and was art editor of the *American Magazine*, 1908-1913. He has written *Salt* (1917); *Brass* (1921); *Bread* (1923); *Pig Iron* (1925); *Zelda Marsh* (1927); *Seed* (1930); *Zest* (1933).

**Norris, Frank** (1870-1902), American novelist, was born in Chicago. He engaged in journalism in San Francisco, where he became editor of *The Wave*. He was also war correspondent and served in South Africa and Cuba. His general reputation began with the publication of a trilogy of novels which dealt with the production, the exchange, and the distribution of American wheat. The first part, *The Octopus*, was published in 1901, and met with immediate success. The second part *The Pit*, appeared in 1903, after Norris' death. The third part, *The Wolf*, was planned but not completed.

**Norris, George William** (1861-1944), American public official, was born in Sandusky co., Ohio. He studied law at Valparaiso, Indiana, moved in 1885 to Nebraska, and has been United States Senator from 1913 to the present. Among his political acts have been his fight to overthrow 'Communism,' so-called, in the House, and for the anti-injunction Act and the Muscle Shoals Act. He was the author of the Twentieth Amendment to the Constitution of the United States (see CONSTITUTION), the so-called 'lame-duck amendment,' which came into effect with the assembling of the Congress of 1935.

**Norris, Kathleen Thompson** (1880- ), American novelist, was born in San Francisco. She was educated by private teachers and did special work in the University of California. She married Charles Gilman Norris. Among her novels are *Mother* (1911); *The Rich Mrs. Burgoyne* (1912); *Poor Dear Margaret Kirby* (1913); *'Saturday's Child'*, (1914); *The Story of Julia Page* (1915); *Josslyn's Wife* (1918); *Sisters* (1919); *Certain People of Importance* (1922); *The Callahans and the Murphys* (1924); *Little Ships* (1925); *Beauty and the Beast* (1928); *Passion Flower* (1930); *Margaret Yorke* (1930); *Belle Mère* (1931); *Walls of Gold* (1933); *The Venables* (1941). She has also written *My San Francisco* (1932) and *My California* (1933).

**Norris, William Edward** (1847-1925), English novelist, was born in London. *Heaps of Money* (1877) was the first of a series of

novels, which includes *The Credit of the Country* (1902), *Barkam of Bellana* (1905), *Not Guilty* (1910), *The Fond Fugitive* (1917), *The Triumphs of Sara* (1920), *Sabine and Sabina* (1921), *Next of Kin* (1922).

**Norristown**, borough, Pennsylvania. co. seat of Montgomery co., on the Skuylkill River. It occupies a picturesque site surrounded by hills. The river is spanned by bridges connecting the borough with Bridgeport. Norristown is a flourishing manufacturing place. The place is said to have been first settled by a company of Friends from Wales about 1690. Practically it dates from 1785. Valley Forge. Washington's headquarters in the winter of 1777-8, is 6 m. to the w.; p. 38, 181.

**Norrköping**, seaport. Sweden, on Motala River; a modern well built town, with fine parks and broad streets. Notable buildings are the Mattens-Kyrka (modern), the St. Olai-Kyrka, built in 1767 and recently restored, and the Art Museum; p. 58, 358.

**Norrland**, the largest and northernmost historical division of Sweden, comprising the counties of Gäfleborg, Västernorrland, Jamtland, Vesterbotten, and Norrbotten.

**Norsemen**, generally, the inhabitants of Scandinavia, more particularly those of Norway, who ravaged the coasts of Northwestern Europe from the 8th to the 11th century. They were also known as Vikings. 'creek dwellers,' from *vik*, a creek, cove, or fiord. The Norsemen were driven to seek a career abroad by divers unfavorable conditions at home. Scandinavia was over-populated; the land system left nothing for the younger sons to do; while the process by which the stronger chiefs aggrandized themselves at the expense of the smaller drove the minor chiefs to seek their independence on the high seas. The history of their exploits may be divided into two periods—one of plundering expeditions, which lasted till the middle of the 9th century, and the other as conquering invaders setting up kingdoms. About the end of the 8th century they began to make descents on the English Coast, where they were known as Danes; and at the same time they ravaged the shores of Flanders and France. Gradually they worked their way southward, and soon there was a Norse camp at the mouth of nearly every navigable river in France. Three times they captured Paris (845, 857, 861), though on a fourth attempt they were repulsed. Alfred drove them from England, but Charles the Simple of France tried to buy their favor by making over to Rollo the duchy of Normandy as a feudal fief (912),

on condition that Rollo embraced Christianity; and it was from this settlement that the Normans came to conquer England (1066).

As early as 860 the Norsemen entered the Mediterranean, and eventually they founded kingdoms in Lower Italy and in Sicily. The Eastern Empire almost fell before them; but this attack came from Russia, where Norsemen had founded a kingdom and a dynasty, that of Rurik (862-1598). But when Russia became Christian under Vladimir (988), the Norsemen, as the Varangar Guard, became a bulwark of the declining Byzantine Empire.

**North, Frederick, Lord, 2nd Earl of Guilford** (1732-1792), Eng. statesman; Pr. Min. (1770-1782); succeeded in passing Boston Port Bill; and the tax levy in America.

**North, Simon Newton Dexter** (1849-1924), American journalist and statistician, was born in Clinton, N. Y. He edited the *Utica Morning Herald* (1869-86) and the *Albany Express* (1886-8). He was appointed chief statistician for manufactures of the twelfth census, and in 1903, director of the United States census. He was in 1906 chairman of the American Tariff Commission to Germany.

**North Adams**, city, Massachusetts, Berkshire co., in the n.w. corner of the State, on the Hoosac River. Greylock (3,535 ft.), the highest peak in Massachusetts, is included within the city limits. A natural bridge in the vicinity (50 ft. high), the Mohawk Trail, and Fort Massachusetts are features of interest. North Adams is a manufacturing center composed of several villages, and is an important trading center for the surrounding district. Fort Massachusetts was an early frontier post and was captured by the French in 1746; p. 22,213.

**North America**, the northern part of the continent known as the New World. Including Greenland, it lies between the meridians of 20° and 170° w. long., but the mainland does not extend east of 55° w. It tapers gradually from n. to s. The mainland reaches the parallel of 71° n. lat., and is fringed by islands which extend to within 7° or 6° of the North Pole. In the s. the conventional boundary is at the narrow isthmus of Panama, only 40 m. across, 9° from the equator. Central America is thus properly included in North America. The greater part of North America lies in temperate latitudes, but, because of its great breadth at the n., about one-fourth of the total area is polar waste. The length of the mainland on the meridian of 100° w. is about 4,000 m., and the breadth

on 50° n. is 3,200 m.; the total area is 8,035,630 sq. m.

North America may be divided into six great natural areas. (1.) *The Archæan Shield of Hudson Bay and the Great Lakes*. In the n.e. is a vast undulating region of very moderate elevation, of which the shallow Hudson Bay is the core. It is composed of Archæan or pre-Cambrian rocks, and is homologous with the Baltic shield of Europe.

(2.) *The Eastern Highlands*, like those of Europe, to which they are in great part homologous, may be divided into two regions. (a) The Northeastern Highlands run as a narrow band of gneiss mountains from the Strait of Belle Isle to Lancaster Sound, and probably are continued in Grinnell and Grant Lands. (b) The Appalachian or Southeastern Highlands can be traced from Newfoundland to northern Georgia and Alabama, where they merge into the coastal plain that borders the Gulf of Mexico. The region has passed through more than one mountain-making epoch, and the present topography is the product of more than one erosion cycle. West of the folded Appalachians the rocks tend to horizontality, the eastern escarpments being known as the Cumberland, Alleghany, and Catskill mountains. The Atlantic coast is bordered by a narrow belt of gently sloping strata, indicating, by their age and altitude, a comparatively recent elevation above the sea.

(3.) *The Mississippi Valley and Great Plains* are composed of horizontal rocks, Palæozoic in the e., where they overlie the Archæan shield, Mesozoic farther w., and here and there covered with marine and non-marine deposits of Cretaceous and Tertiary age. From the Mississippi valley line, which represents their lowest level, they rise gradually westward to 5,000 or 6,000 ft. at the base of the Rocky Mountains. In the s. they are terminated by a low coastal plain round the Gulf of Mexico, bordered by many lagoons, beyond which the delta of the Mississippi projects like a bird's foot. The Mississippi valley, as a whole, is extremely level and uniform. This great valley is the largest continuous body of agricultural land on the globe.

(4.) *The Western Cordillera Area* consists of a series of mountainous plateaus, which may be named after the rivers draining them—Yukon, Fraser, Columbia, the Great Basin of inland drainage, Colorado, and also that of Mexico. The highest peaks are grouped in Colorado, California, Alaska, and Mexico,

many of them surpassing 14,000 ft. Fully 2,500,000 sq. m., or almost one-third of the continent, are included in this great plateau region, bordered on the e. and w. by two complex mountain chains.

(a) The eastern chain, known as the Rocky Mountains, with its indirect prolongation in the Sierra Madre Oriental of Mexico, extends from the west of the Mackenzie delta to the isthmus of Tehuantepec. (See ROCKY MOUNTAINS.) In the northern or Canadian ranges the scenery is rugged and alpine, owing to the comparatively low snowline. South of the Yellowstone valley, with its canyons of diverse colored rocks, its sinter terraces, and great geysers, the chain widens, and in Colorado is 60 m. broad.

The Yukon plateau is a region of many rounded, bleak hills, covered with snow for much of the year. The Fraser and Columbia plateaus are more mountainous, and are crossed from n. to s. by lofty ranges; the Columbia plateau terminates in the great lava fields of Idaho, across which the Snake and other tributaries of the Columbia have cut deep gorges. The Mexican plateau rises steadily from n. to s., where it is termed the plateau of Anahuac. The Cordilleran plateau occupies the major part of the area of Mexico, and includes several famous volcanoes—Orizaba reaching 18,250 ft. and Popocatepetl, rising 17,520 ft.

(b) The western chains bordering the Cordilleran areas are the parallel Plateau and Pacific chains. Of the Plateau chain, the St. Elias alps form the loftiest region—Mt. McKinley, 20,464 ft., being the highest known point in North America. The Northern Cascades are covered with recent volcanic deposits. Great extinct volcanoes rise to upwards of 14,000 ft. and the range ends in the symmetrical cone of Mt. Shasta. The Sierra Nevada succeeds, of which some granite domes rise to over 14,000 ft. (Mt. Whitney, 14,900 ft.). The Plateau chain sinks to a deep valley in the w., represented by the Hecate, Queen Charlotte, and Puget Sound.

(5.) In *Central America* in the w. is a range of young volcanic mountains; in the e. are folded mountains, which strike w. to e.

(6.) The *West Indies* consist of four large islands—the Greater Antilles, whose axes lie w. to e., and a chain of smaller ones, the Lesser Antilles, which extend n. to s., the whole bounding the Caribbean Sea on the n. and the e.

The continent is sufficiently large to permit great extremes in the interior, which are

modified by Hudson Bay, the Great Lakes, and the Gulf of Mexico. The hottest region in summer is the s.w., where a temperature of 120° is sometimes recorded; the west coast is remarkable for its uniform temperature. The range of temperature is greatest in the n., between the mouth of the Mackenzie and the s. of Hudson Bay (over 150° F.). Northern Virginia at 40° n. latitude has a temperature about equivalent to British Columbia at 50° no. It is much colder in eastern North America than at corresponding latitudes in Europe. America lies largely in the zone of the anti-trades or westerly winds. The great mountain ranges' influence on them would tend to convert the whole Great Plains area and much of the Mississippi valley into an immense desert, under normal conditions, but the cyclonic storms from the Gulf of Mexico induce an easterly eddy that draws moisture from the gulf region over a remarkably large proportion of the endangered belt so that a rainfall of 30 to 60 inches prevails. The east coast has a rainfall of 40 to 50 inches.

The western mountains form the great n. to s. divide, which lies nearer the eastern than the western chain. The great rivers of intermont plateaus—the Yukon, the Fraser and Columbia, the Colorado—reach the Pacific. The longest rivers rise in the Rocky Mountain chain, w. of the main crests, and flow across the Great Plains—the Peace-Mackenzie to the Arctic, the Saskatchewan-Nelson to Hudson Bay, and the Missouri-Mississippi to the Gulf of Mexico. Of the eastern rivers the St. Lawrence, draining five of the largest lakes, is the most important; while the drowned valley of the Hudson forms a waterway across the Appalachian highlands. Most of the drainage is toward the Atlantic, but large areas drain into the Arctic and Pacific oceans. The continent has immense drainage systems—the Mississippi, for example, discharges more water than all of the streams, both large and small, of all Europe. The Great Lakes are the largest association of fresh water on the globe. They cover 89,000 sq. miles. The largest area of inland drainage is the Great Basin, where Great Salt Lake is the remnant of a once much more extensive body. The coast line is extremely irregular. There are six great peninsulas—Alaska, Labrador, Nova Scotia, Florida, Yucatan, and Lower California. The Atlantic coast line is indented by no less than ten great bays or gulfs—Hudson Bay, Gulf of St. Lawrence, Bay of Fundy, Massachusetts Bay, Long Is-



land Sound, Delaware and Chesapeake bays. Albemarle and Pamlico sounds, and the Gulf of Mexico. The Pacific coast is fairly regular.

North America may be divided into five faunal provinces:—(1.) The tundra or Arctic province, with polar bear, reindeer, and other forms similar to those in the Old World Arctic province. (2.) The Canadian or cold province, with caribou indistinguishable from the reindeer of the Arctic province, the moose (elk of Europe), bison (the so-called buffalo, now nearly extinct, but rigidly protected), the bighorn sheep, the fox, beaver, and other fur-bearing animals. (3.) The western or arid province is the richest in species, with the prongbuck, the black-tailed deer, and the prairie dog. The jack rabbit is a pest of the sagebrush regions peculiar to it. Grizzly, black, and cinnamon bears live in the Rockies. (4.) The Mississippi, Atlantic, and eastern humid region, with the Virginia opossum and the Virginia deer and the round-tailed musk-rat. (5.) The Central American and low-lying Mexican regions, distinctive by their tropical faunas, containing the monkey, jaguar, tapir, ant-eater, sloth, and armadillo.

At the time of its discovery by Europeans, nearly the whole of North America was inhabited by the Indians. The extreme n. was thinly peopled by Eskimos, whose resemblance to the Mongolian type has suggested an original migration from Asia across the Alaskan region. In the s. a high degree of civilization was reached on the Mexican plateau. The bulk of the population of North America is now identical with that of Western Europe. The population of North America is about 137,750,000, over three-fourths being comprised within the United States.

**Northampton**, municipal, parliamentary, and co. borough, England. It has four ancient churches—All Saints', rebuilt, except the tower, in 1675; St. Giles, with a Norman w. door; St. Peter's, a fine example of Norman architecture; and St. Sepulchre's, of the 11th or 12th century, one of the four round churches still remaining in England. The staple trade is in boots and shoes, the manufacture of which has flourished here since the Middle Ages; p. 92,300.

**Northampton**, city, Massachusetts. It is the seat of Smith College. The leading manufactured products are silk, sewing silk, silk hosiery, cutlery, brushes. Jonathan Edwards was pastor here in 1727-50. Northampton was the home of the late Ex-President Calvin Coolidge; p. 24,794.

**Northamptonshire**, a midland co. of England; area 914 sq. miles. Northamptonshire is the chief seat of boot and shoe manufacture in England; other industries are iron founding, corn milling. It was the scene of the battles of Northampton (1460) and Naseby (1645); p. 309,428.

**North Berwick**, popular seaside and golfing resort, Scotland, in Haddingtonshire, on the Firth of Forth. To the southwest are the remains of St. Mary's Benedictine Nunnery (1154); p. 3,473.

**North Braddock**, borough, Pennsylvania. A large plant of the U. S. Steel Corporation is situated here; p. 15,679.

**Northbrook**, Thomas George Baring, Earl of (1826-1904), English statesman. He was under-secretary for war from 1868 to 1872, when he was made Viceroy of India. He became First Lord of the Admiralty in Gladstone's second government (1880-5).

**North Cape**, a rocky promontory extending from the island of Magerö, Norway, into the Arctic Ocean, generally considered to be the most northerly point in Europe, although the island of Knivskjærødde, to the w., reaches about 1,000 ft. farther n.

**North Carolina** (popularly known as the 'Old North State,' 'Tar Heel State,' and 'Turpentine State'), a South Atlantic State of the United States. The total area is 52,426 sq. miles, of which 3,686 are water surface.

North Carolina is divided into three distinct topographical regions—the Coastal Plain, the Piedmont Plateau, and the Appalachian Highland. The southeastern face of the Blue Ridge escarpment, rising 1,200-1,500 ft. above the Piedmont Plateau, forms the border of the Appalachian Highland. The Black Mountains include the loftiest peaks of the Appalachian system, the highest being Mount Mitchell, or Black Dome, 6,710 ft. The climate varies greatly from southeast to northwest, changing from subtropical to temperate.

The average yearly cotton production is 400,000 bales from 857,000 acres valued at \$17,400,000. North Carolina ranks high in tobacco production with a crop valued at \$119,187,000. In minerals, the State ranks first in the production of mica, and there is much magnetic iron ore. In manufacturing, it is now the leading State in the production of cotton goods. An important industry is the manufacture of cigars and cigarettes.

The chief institutions for higher education are the State University, Chapel Hill; Duke University, Durham; and the Agricultural

College, West Raleigh. In 1868, shortly after the Civil War, North Carolina adopted a new constitution. The chief executive officers are the Governor, Lieutenant-Governor, Secretary of State, Auditor, Treasurer, Attorney-General, and Superintendent of Public Instruction—all elected for four years.

During the latter part of the sixteenth century three expeditions were sent by Sir Walter Raleigh to the present Carolinas, then known as Virginia. The first expedition (1584) did not attempt a settlement, but returned with a glowing account of the land. The second expedition (1585) landed at Waccam, and pushed on to Roanoke Island, where a settlement was founded. The next year, after suffering from Indian hostilities and lack of food, the colonists returned to England with Sir Francis Drake. The third expedition (1587), led by John White, re-established the settlement at Roanoke. A child, Virginia Dare, born soon after the arrival of the colonists, is believed to have been the first child born of English parents in America. Upon White's return from England in 1591, whither he had gone for supplies, he could find no trace of the colony.

In 1663 and 1665, Charles II. of England granted to eight 'Lords Proprietors' full palatine powers in the territory lying between 29° and 36° 30' N. lat., and extending to the Pacific Ocean. The proprietors divided this region into North and South Carolina, and sent out settlers. In 1669 the philosopher John Locke drew up an elaborate plan of government for the colony, called the 'Fundamental Constitution.' This plan was never fully put into operation, however. Meanwhile, in 1653, the first permanent settlement had been made in the present limits of North Carolina, at Albemarle, by a company of Virginia dissenters. Owing to the turbulence of the colony, the proprietors, except Lord Carteret, sold their shares to the Crown in 1728 for \$12,500 each. Thereafter a royal governor was sent to each of the Carolinas.

North Carolina was a leader in the American Revolution, and its territory was the scene of some important campaigns. A provincial congress in 1774 elected delegates to the Continental Congress; and in May, 1775, an assembly at Charlotte is said to have passed resolutions abolishing royal government in North Carolina. In April, 1776, the delegates in Congress from North Carolina were instructed to vote for independence; and eight months later a State constitution was ratified. The State was invaded by the

British troops in 1780-81. In November, 1789, North Carolina ratified the United States Constitution. In 1790 the western part of the State—now the State of Tennessee—was ceded to the U. S. Government. In 1791 Raleigh was made the capital. In 1835 a new State constitution was drafted, which gave representation in the lower house according to population, and in the senate according to property.

At the approach of the Civil War, North Carolina opposed secession; but when the first steps toward coercion were taken in the North, a secession ordinance was unanimously adopted (May 20, 1861). During the war the State furnished more than 120,000 men, losing more soldiers than any other Confederate State. During the days of Reconstruction, a military government was placed in power. In 1868 a new constitution was adopted ratifying the Fifteenth Amendment. In 1900 the so-called 'grandfather clause' was added to the constitution; also an educational qualification intended primarily to limit Negro suffrage. After 1900 the State made gigantic strides, advancing along three main roads, textile manufactures, tobacco growing and manufacturing, and the development of electric power.

In 1931, three laws were passed: a State commission was given the power to approve, advertise and sell all bonds of local governments; the State was made responsible for the operation of all public schools, aided by an equalization fund of \$17,000,000 raised by taxation; the State was given custody of many more prisoners, to be used on public roads. In 1932 a new constitution was drafted by a commission headed by Chief Justice Walter P. Stacy of the Supreme Court.

Its chief port is Wilmington; the capital is Raleigh; the largest town is Charlotte; Asheville is the chief resort. The Pinehurst golf course is famous throughout the country; p. 3:571,623. Consult Ashe's *History of North Carolina* (2 vols. 1925); Hobbs' *North Carolina, Economic and Social* (1930).

**North Carolina State College of Agriculture and Engineering**, an institution for higher education located at Raleigh, N. C. In 1931 it was merged with the University at Chapel Hill and the North Carolina College for Women.

**North Carolina, University of**, an institution of higher learning at Chapel Hill, N. C., 28 miles northwest of Raleigh, chartered in 1789, and opened in 1795. It is governed by a board of trustees elected by the legis-

lature, and is free from sectarian or political control. It was merged, in 1931, with the State College at Raleigh, and the North Carolina College for Women.

**Northcliffe, Viscount (Alfred Charles William Harmsworth)** (1865-1922), British writer and newspaper proprietor, was born in Dublin, Ireland. In 1888 he founded the weekly journal *Answers*, and six years later bought the *Evening News*. He founded the *Daily Mail* in 1896, and became chief owner of *The Times* in 1908. He equipped the Jackson-Harmsworth Arctic Expedition in 1894, and organized the *Daily Mail* aviation prize of \$50,000. In 1917 he visited the United States as head of the British War Mission to co-ordinate war work. In 1918 he was made director of propaganda in enemy countries. He wrote *My Journey Round the World* (1923).

**Northcote, Sir Henry Stafford Northcote, Baron** (1846-1911), English administrator. He was attached to the Marquis of Ripon's mission to negotiate the *Alabama* treaty with the United States (1871); was secretary to the British Claim Commission under the treaty of Washington (1871-2). He was raised to the peerage in 1900, on his appointment as governor of Bombay; and from 1903 to 1908 he was governor-general of the Australian Commonwealth.

**Northcote, James** (1746-1831), English painter. He was known by his historical works, which include paintings of the *Murder and Burial of the Princes in the Tower*, and of the *Death of Wat Tyler*.

**North Dakota**, one of the North Central States of the United States. The total area is 70,605 sq. miles. The State is a part of the Great Plains region, and is for the most part a vast stretch of rolling prairie. The principal river is the Missouri, which enters the State in the northwest and leaves it near the middle of the southern boundary. There are a number of lakes in the eastern half of the State, among them being Devil's Horsehead, and Long. The first-named is a salt lake about 40 miles in length, situated in a basin having no outlet to the sea.

The climate of North Dakota is strictly continental. At Williston the extremes are  $-49^{\circ}$  and  $107^{\circ}$ . The dryness of the atmosphere makes these great extremes not only bearable, but healthful. Farming is the principal industry. The census of 1930 returned 38,657,894 acres in 77,975 farms, land and buildings valued at \$951,225,446. Wheat is the crop most extensively grown. In 1938,

79,839,000 bu. were harvested. North Dakota is the premier state in the production of flax and flax seed; 1,490,000 bu. were harvested in 1938. The raising of livestock is very important. Institutions of higher learning include the North Dakota University, at University; the North Dakota Agricultural College, at State College; the State Science School, at Wahpeton; the State School of Forestry at Bottineau; and Jamestown College (Presbyterian), at Jamestown.

The present constitution of North Dakota is that adopted in 1889, as subsequently amended. The chief executive officers are the Governor, Lieutenant-Governor, Secretary of State, Auditor, Treasurer, Superintendent of Public Instruction, Commissioner of Insurance, Attorney-General, railroad commissioners, and Commissioner of Agriculture and Labor—all elected biennially.

Explorations in the territory which now constitutes North and South Dakota were made by French Canadians at Pembina in 1780, and by the Lewis and Clark expedition, which encamped at a spot about fifteen miles w. of the present town of Washburn, from October, 1804, to April, 1805. The region was included in the Louisiana Purchase of 1803. From 1804 to 1812 it was a part of Louisiana Territory, which in 1812 was renamed Missouri Territory. In 1849 that portion of North Dakota e. of the Missouri River was made part of Minnesota Territory, and that portion w. of the river became part of Nebraska Territory. In March, 1861, Dakota Territory was formed—including the present Dakotas, most of Montana, and a large part of Wyoming. In 1863, on the formation of Idaho Territory, the Dakotas were reduced to practically the present limits. In 1889 the territory was divided 'on the line of the seventh standard parallel'; and on Nov. 2, 1889, the two portions were admitted to the Union as North and South Dakota.

Until about 1870 settlement was greatly retarded by the depredations of the Sioux Indians, who claimed, under treaties with the United States Government, part of the territory. Uprisings of the Sioux, under their chief, Sitting Bull, took place in 1876-7, and 1890-91. North Dakota has been the theatre of several social experiments, the State under the Non-Partisan League entering business enterprises, including banking and co-operative grain elevators. In 1930 a fire destroyed the State capital at Bismarck. Valuable official records were almost all

burned; p. 641,935. Consult Fish and Black's *Brief History of North Dakota* (1925); Young's *Government of North Dakota* (1926).

**North Dakota Agricultural College**, a co-educational institution at Fargo, N. D., founded in 1890 under the provisions of the Morrill Act of 1862, under which it received 90,000 acres of the public lands, with 40,000 acres in addition under the enabling act.

**North Dakota, University and School of Mines of**, a co-educational institution at Grand Forks, N. D., chartered in 1883. It became the State University on the admission of North Dakota into the Union (1889), when by the enabling act it received a grant of 86,080 acres of the public lands—the School of Mines receiving 40,000 acres.

**Northeast Boundary Dispute**, the controversy between the United States and Great Britain concerning the northeastern boundary of the United States. This part of the dividing line between the United States and Canada was vaguely described in Article II. of the Treaty of 1783 as being 'from the northwest angle of Nova Scotia—that angle which is formed by a line drawn due n. from the source of the St. Croix River to the Highlands—along the said Highlands, to the northwesternmost head of the Connecticut River'; and 'e. by a line to be drawn along the middle of the River St. Croix, from its mouth in the Bay of Fundy to its source, and from its source directly n. to the aforesaid Highlands.'

A dispute soon arose as to the exact meaning of the treaty. The Jay Treaty of 1794 settled the dispute so far as the St. Croix River was concerned. Five of the eleven articles of the Treaty of Ghent (1814) also related to the dispute. In 1817 a minor question, relating to the ownership of the islands in Passamaquoddy Bay, was settled by a commission appointed in pursuance of the Treaty of Ghent, the United States receiving Moose, Frederick, and Dudley islands. In 1838-9 the territory in dispute between Maine and New Brunswick was the scene of a petty border war, known as the Aroostook Disturbances, which brought relations between the United States and Great Britain to a crisis. The entire dispute was finally settled by the Ashburton Treaty of 1842.

**Northeast Passage**, the sea route between the Atlantic and Pacific Oceans by the n. of Asia. It was traversed by Nordenskjöld during 1878-9, by Vilkitski in 1915, and by Amundsen in 1918-20.

**Northern Lights**. See *Aurora Borealis*.  
**Northern Territory** (formerly *Alexander Land*), until 1911 the northern portion of South Australia, lying n. of 26° s., and between 129° and 138° E. Area, 523,620 sq. miles. Much of it is desert. Northern Territory was added to South Australia in 1863, and was transferred to the Commonwealth on Jan. 1, 1911; p. 4,616.

**Northers**, cold, dry winds occurring from September to March in the region of the United States bordering on the Gulf of Mexico—the result of a cold wave. They are often dangerous to shipping and destructive to vegetation. After the passage of a cyclonic center the norther may cause a fall of temperature of from 20° to 50° F. in a few hours.

**Northfield**, town and summer resort, Massachusetts. It is the birthplace of Dwight L. Moody, who founded here the Northfield Seminary for Young Ladies in 1879. The town was incorporated in 1672; p. 1,975.

**Northfield**, city, Minnesota. It is the seat of Carleton College, St. Olaf College, and the Goodsell Observatory; p. 4,533.

**Northfield**, town, Vermont. It is the seat of Norwich University, the military college of Vermont; p. 2,129.

**Northfleet**, w. suburb of Gravesend, Kent, England, on the Thames. It has a 13th century church; p. 16,429.

**North German Confederation**, a federation of the North German states under the acknowledged supremacy of Prussia, supplanting the former federation in which Austria had been supreme. It was formed in 1867, following the defeat of Austria by Prussia in the Seven Weeks' War, under the guidance of Bismarck, who wrote its constitution.

**North Island**, one of the two main islands of New Zealand.

**North Pole**. See *Arctic Exploration*; *Peary*, R. E.

**North River**. See *Hudson River*.

**North Sea**, or *German Ocean*, extends from the shores of Belgium, Holland, and Germany n. to the Norwegian Sea at the latitude of the Shetland Isles, a distance of 600 miles. Its maximum breadth is 400 miles, and its area is estimated at from 162,000 to 220,000 sq. miles. Several banks are scattered over the bed of the sea, the principal being the Dogger Bank. Numerous mammal remains—mammoth, woolly rhinoceros, Irish elk—have been dredged up from it. To the northeast of it lies the great Fisher Bank.

Water from three sources enters the sea—Baltic water through the Skager Rak, Atlantic water through the Shetland-Færoe Channel and the Strait of Dover, and Arctic water through the Norwegian Sea. The meeting of the tidal wave from the n. and that from the Strait of Dover causes the high tides which help to make London an important port. Fisheries are very productive. Cod, herring, halibut, plaice, haddock, sole, turbot, and whiting are caught. During the World War most of the major naval engagements between the German and British fleets were fought in the North Sea.

**North Sydney**, town, Nova Scotia. It is a port of entry, having steamship connection with Montreal, Quebec, Halifax, St. Johns (Newfoundland), St. Pierre, Miquelon, and points of North Cape Breton; p. 6,585.

**North Tarrytown**, village, New York. In the vicinity are laid the scenes of Washington Irving's *Sleepy Hollow*; and the author is buried in Sleepy Hollow Cemetery. The Old Dutch Church, erected in 1699, still serves its original purpose; p. 8,804.

**Northumberland**, the most northern co. of England, separated from the Lowlands of Scotland by the Tweed and the Cheviot Hills. Coal is worked chiefly in the s., with an annual output of 15,000,000 tons. Other minerals are lead, zinc, building stone, and fireclay. Northumberland in the time of the Romans was inhabited by a branch of the Celtic people. The Great Wall, 70 miles long, constructed by the Romans, and attributed to Hadrian, lies n. of the Four Dykes. In the sixth century, Northumberland was conquered and colonized by the Angles. It then formed part of the kingdom of Bernicia, and later of Northumbria. Being a border county, it suffered much during the Scottish wars. Area, 2,018 sq. miles; p. 408,665.

**Northumberland, Dukes and Earls of**, members of the British nobility. The first duke was John Dudley (?1502-53), who became warden of the Scottish Marches (1542). Henry Percy, first earl of Northumberland (d. 1408), dethroned Richard II., and defeated the Scots at Homildon Hill (1402).—His son was Henry Percy, surname 'Hotspur.' He is introduced into the first part of Shakespeare's *Henry IV*. The present duke is descended from Sir Hugh Smithson (d. 1786).

**Northumbria**, a kingdom of Anglo-Saxon England formed by the union of *Deira* and *Bernicia*. It was established by Æthelfrith, who reigned from 593 to 617. After his death

he was succeeded by Edwin, who belonged to the Deiran house. From his accession to the death of Egfrith, in 685, Northumbria, in spite of sundry reverses, remained the principal kingdom in Britain. Edwin's marriage with Ethelburh, daughter of Ethelbert, king of Kent, led to the introduction of Christianity into Northumbria. Bede, who lived from 672 to 735, wrote his *Ecclesiastical History* and other works, and the monasteries of Lindisfarne, Whitby, and Jarrow became famous for learning. From Northumbria, too, proceeded the missionaries who in the eighth century converted a great part of Germany. It was not till the reign of William the Conqueror that Northumbria really became a part of England.

**North Vancouver**, town, British Columbia. It is visited by tourists for the views and drives in the environs; p. 8,196.

**Northwest Boundary Dispute**, the dispute between the United States and Great Britain concerning the northwestern boundary of the former country. The treaty which ended the War of Independence (1783) had fixed the northwestern boundary as a line running from the northwest point of the Lake of the Woods to the Mississippi River, which was then regarded as rising in Canada. Shortly before the Florida Treaty (1819), a convention with Great Britain decided that the line of 49° n. lat. should form the boundary westward as far as the Rocky Mountains, and that w. of these the land was to be held in common for ten years (1818). When Russia surrendered all claim to the country s. of the present boundaries of Alaska (1825), another agreement became necessary, and common possession of the 'Oregon' territory was extended for an indefinite number of years (1827). This agreement lasted until 1846.

Shortly before that date the Oregon country began to be settled by immigrants, and the Democratic Party took up an aggressive attitude in demanding the rights of the United States over the neutral territory. 'Fifty-four Forty or Fight' became an election cry; and as Great Britain was unwilling to concede land as far n. as 54° 40' n. lat., a period of crisis ensued. Ultimately the jingo policy was defeated, and in 1846 a compromise was arrived at, extending the boundary of the forty-ninth parallel across the Rocky Mountains to the Coast, and drawing the line down the Strait of Juan de Fuca to the Pacific, thus giving Vancouver to Canada. Oregon became a Territory two years later;

but as part of the boundary was still vague, the dispute was finally settled by the Emperor William I. of Germany in favor of the United States (1872).

**Northwestern University**, a co-educational institution of higher learning under the auspices of the Methodist Episcopal Church founded in 1851, and situated in Evanston and Chicago, Illinois. The schools and colleges at Evanston are on a campus of 75 acres along the shores of Lake Michigan. Northwestern University Gymnasium is one

ada in the northwestern part. They consist of three provisional districts, Mackenzie, Keewatin, and Franklin. The total area is 1,309,682 sq. miles; population, 9,600, mostly Eskimos and Indians. Fur production is chief occupation.

**Northwest Territory**, the name given to the region w. of Pennsylvania, e. of the Mississippi River, n. of the Ohio River, and s. of Canada. The greater part of this vast territory belonged to France prior to 1763, when it was ceded by treaty to Great Britain,



*Photo by Ewing Galloway, N. Y.*

*Norway: Nord Fjord.*

of the largest of its kind in the world. The enrollment is 6,424 students with 642 faculty members. During 1932-33 the Deering Memorial Library and the George R. Thomas Auditorium were completed. President, Wallace Dill Scott.

**Northwest Passage**, a route for ships from the Atlantic to the Pacific Ocean by the n. of the American continent. Franklin and others proved its existence, and it was first traversed by Roald Amundsen in the *Gjøa* during 1903-6.

**Northwest Territories**, districts of Can-

who, at the close of the Revolution, ceded it to the United States. For several years, owing to conflicting claims of Massachusetts, New York, Virginia, and Connecticut, its exact status was uncertain, but at length these disputes were settled, and the region was organized as a Territory of the United States under the famous Ordinance of 1787. The Ordinance prohibited slavery; provided that not less than three nor more than five States were to be formed; that a State was to be admitted to the Union when it should have a population of 60,000; and that a general

assembly was to be organized for the Territory as soon as the population should have reached 5,000. The Ordinance also contained a bill of rights, secured freedom of worship, the benefits of the writ of habeas corpus, and exemption from cruel or unusual punishments, and encouraged education and good faith toward the Indians. The Northwest Territory was governed as such from 1788 to 1802, Arthur St. Clair being governor; and from it were created the States of Ohio, Indiana, Illinois, Michigan, and Wisconsin.

**Northwich**, town, England. It has the Church of St. Helen, dating from the sixteenth century. Boat building, brick making, and iron founding are carried on, but by far the most important industries are the manufacture of salt and alkali; p. 18,385.

**Norton**, town, Massachusetts. Wheaton College for Women, and the House in the Pines for girls are situated here; p. 3,107.

**Norton, Andrews** (1786-1852), American theologian, was born in Hingham, Mass. He was a distinguished exponent of Unitarianism, equally determined in his protest against Calvinism and in his opposition to the school of Theodore Parker and the naturalistic theology.

**Norton, Charles Eliot** (1827-1908), American educator, was born in Cambridge, Mass. From 1864 to 1868 he was co-editor, with James Russell Lowell, of *The North American Review*. He traveled extensively; was an intimate friend of Carlyle, Ruskin, Longfellow, and Lowell; and an enthusiastic student of Dante. He was Ruskin's literary executor, and organized exhibitions of Turner and Ruskin drawings. He published: *The Divine Comedy of Dante* (1891); *Letters of J. R. Lowell* (1893). He also edited *The Correspondence of Carlyle and Emerson* (1883), and other Carlyle correspondence, and the works of G. W. Curtis, Ruskin, and others.

**Norton, Richard** (1872-1918), American educator, son of Charles Eliot Norton, was born in Dresden, Germany. From 1899 to 1907 he was director of the American School of Classical Studies at Rome. At the beginning of the Great War he organized the American Volunteer Motor Ambulance Corps. He published *Bernini and Other Studies in the History of Art*.

**Norton, Thomas** (1532-84), English lawyer and poet, was born in London. As a poet he is best known as joint author with Sack-

ville of the first tragedy in English and in blank verse, *The Tragedie of Gorboduc* (1561).

**Norton Sound**, an arm of Bering Sea, on the w. coast of Alaska. It runs inland 200 miles, and receives the waters of the Yukon River.

**Norumbega**, a name of somewhat uncertain connotation which appears on sixteenth and seventeenth century maps of America, to indicate either an extensive region, a river, or a city in North America. The area is that covered by the present New England States; the river may be the Penobscot, the Hudson, or the Charles; and the city may be Watertown, Mass., but it was probably mythical.

**Norwalk**, city, Connecticut. There are manufactures within the township of felt and cloth hats, corsets, underwear, shirts, shoes. p. 39,849.

**Norway** (Norwegian, *Norge*), an independent kingdom (since 1905) of Northern Europe. The extreme length is 1,100 miles, while the breadth varies from 60 miles in the n. to 270 miles in the s. Area, 124,964 sq. miles; p. 2,890,000. Capital, Oslo (formerly Christiania). The reigning king is Haakon VII.

Norway forms the western portion of the Scandinavian Peninsula, and is in configuration a vast plateau, the eastern portion of which is intersected by large valleys, while the western and northern parts are indented by winding fiords. In the far n. the mountains attain a height of 6,000 ft. Three distinct mountain ranges are Kjølen, Dovrefjeld, and Langfjeldene. The longest river, the Glommen, and the largest lake, Mjøsen, are both situated in the s. A third of the country is situated within the frozen zone. At Oslo the mean winter temperature is 25° F. Glacial action has played an important part in the configuration of the country, the innumerable fiords and islands along the coast having resulted therefrom. The most noteworthy feature of the landscape is the marine terraces which appear at regular intervals on the sides of the valleys and fiords, sometimes cut out of solid rock, or heaped up in layers of sand and gravel by the pounding of the waves. Norway has but 4,300 sq. miles of land under cultivation; three-fourths of the land is unproductive. Norway is essentially a maritime country. In 1938 it had a merchant fleet of 4,613,175 gross tonnage. Sea fishing is an important industry; the value of the sea fisheries catch was 86,101,000 kroner in 1938, cod, herring, mackerel, sal-

mon, lobsters being the most important fish commercially. The leading products are timber, whale-oil, wood-pulp, and paper. Chief crops are wheat, rye, barley, potatoes.

In the Viking expeditions (eighth century onward) the Norwegians took a leading part, helping to conquer and colonize the islands between the Arctic Circle and Ireland, and planting petty kingdoms in Ireland itself, where the chief ports are of Norse origin. Harold Haarfager founded the Norwegian kingdom by his victory at Hafrsfiord (872) over the local kinglets. The mainland of America is supposed to have been discovered by Norsemen about 1000. They also invaded the British Isles, suffered a great reverse at Clontarf, in Ireland, in 1014, and for a time were in possession of the Orkney and Shetland Islands and the Hebrides. Christianity was first introduced by Olaf Tryggvason. The organization of the Norwegian Church as an independent establishment took place about 1150.

Throughout the earlier Middle Ages Norway was the theatre of an almost perpetual struggle between rival pretenders to the throne, which resulted in the weakening of the royal authority and the domination of an aristocratic caste. The contest between the crown and the magnates terminated in favor of the crown under Haco the Old (1217-1263), who is also famous as the subjugator of Iceland and Greenland. The last invasion of Scotland was repelled by Alexander III. when he defeated Haco's great expedition at Largs in 1263. His son Magnus the Lawgiver (1263-1284), who first codified the Norwegian laws, surrendered the Hebrides and the Isle of Man to Scotland by the Peace of Perth. Margaret of Denmark, by the Union of Calmar (1397), succeeded in uniting in her own person the three Scandinavian crowns.

The crown prince of Sweden, Charles John, obtained the formal cession of the kingdom from the Danish monarch, Frederick VI., by the Peace of Kiel (Jan. 14, 1814). The Norwegians, however, refused to acknowledge a convention which had been concluded behind their backs, and a national assembly summoned to Eidsvold by the last Danish viceroy, Prince Christian Frederick, after framing a constitution, elected that prince king of Norway. He resigned, and on November 14, 1814, the Norwegian Storting elected the reigning Swedish king, Charles XIII., king of Norway.

Disagreements having arisen, the union between the two countries was peacefully dis-

solved by a joint commission of the two Parliaments, which met at Karlstad. Prince Charles of Denmark was elected king of Norway, under the title of Haakon VII. In 1907 a treaty providing for the integrity of Norway was signed by the representatives of Norway, Great Britain, France, Germany, and Russia. By granting parliamentary suffrage to women in that year, Norway took the first step among European nations in granting them the right to vote. In 1911 (December 14) Captain Roald Amundsen, a Norwegian explorer, discovered the South Pole, and planted the Norwegian flag there.

After the outbreak of the Great War in 1914 Norway joined with Sweden and Denmark in an agreement to remain neutral and to co-operate in every way for the joint interests of the three countries. During the progress of the war several joint conferences were held for the consideration of diplomatic and political questions. In 1919 the Supreme Council of the Peace Conference gave Norway political suzerainty of the Spitzbergen Archipelago, and in 1920 a treaty was signed at Paris in which Norway's sovereignty over the island was recognized. In accordance with the decision of the World Court, in 1933, recognizing the sovereignty of Denmark over Greenland, the Norwegian State Council ordered an end to the occupation by Norway of land in East Greenland. In 1940 Germany seized Norway, and King Haakon became an exile in London, along with the heads of other dispossessed nations. Maj. Quisling was put at the head of the government, with full power; popular uprisings led to mass deportations and severe treatment in concentration camps. In 1944 the Russians entered Norway and Norwegian troops joined them in northern Norway. In May 1945 Quisling was arrested by the Allies and after trial was sentenced to die. He was shot by a firing squad in Oct. 1945.

**Norway, Literature of.** Norwegian literature, properly speaking, is not older than the third decade of the nineteenth century. The skalds and the saga writers were, no doubt, largely of Norse origin, but they wrote in a language which a modern Norwegian would not understand, and an account of their achievements will be found under ICELAND—*Language and Literature*. During the long Danish dominion, Norway can scarcely be said to have had a national literature at all.

After 1814 the chief representatives were C. Hansen, C. N. Schwach, and H. A. Bjerregaard, the last of whom was the au-



thor of the first national drama, *Fjøldeventyret*.

The period between 1830 and 1845 is remarkable for the sharp polemic between the followers of the rival poets Henrik Wergeland (1808-45) and J. S. Welhaven (1807-73), which divided literary Norway into two hostile camps. Another eminent writer of this generation was Wergeland's sister, Camilla Collett, author of the famous romance *Amtmandens Døtre* (1855), the first work which contended for 'the emancipation of the



Norway: The Seven Sisters Falls.

(Photo by Elmendorf, from Ewing Gallo-way, N. Y.)

Scandinavian women.' The patriotic spirit of the Norwegians continued to influence the development of literature through the middle of the nineteenth century. To it we owe the justly admired Norwegian folk tales (*Norske Folkeeventyr*) collected by Asbjørnsen and Møe.

Nor have the *Maalstrøver*, as the dialect writers are generally called, been altogether unsuccessful. They have not indeed superseded Danish; but they have erected an independent language alongside of it which can already boast of a literature of its own, in-

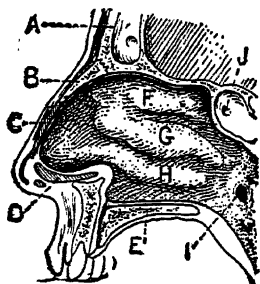
cluding at least one poet (O. Vinje) and one novelist (Arne Garborg) of real genius, and by far the best writer of peasant tales (Jens Tvedt) whom Norway has yet produced—not to mention Ivar Aasen, the lexicographer of the *maal*. On the other hand, nearly all the great modern Norwegian writers, such as Ibsen, Bjørnson, Jonas Lie, Alex. Kjelland, Amalie Skram, Thomas and W. Krag, Christian Elster, Knut Hamsun, and Hans Aanrud—write in what, despite a large admixture of Norse words and expressions, is practically Danish. Within the last two decades moreover, Norway has contributed notably to scientific literature. Among many eminent scholars may be mentioned P. A. Munch and Rudolf Keyser, the founders of the Norwegian historical school; E. Sars, indisputably the greatest of Norwegian historians; Gustav Storm, the antiquarian; N. Nicolaysen; L. Daae; Yngvar Nielsen; J. Lieblein, the Egyptologist; the art critic L. Dietrichsen; the sociologist and statistician E. L. Sundt, who is also an authority on the gypsies; the philosophers Treschow and Monrad; the philologists Unger, Fritzner, and Sophus Bugge.

**Norwegian Sea**, that portion of the Arctic Ocean enclosed between Norway, Shetland and the Faroe Islands, Iceland, Greenland, and Spitzbergen.

**Norwich**, city, municipal, parliamentary, co. borough, and co. in itself, in Norfolk, England. A Norman castle erected soon after the Conquest was rebuilt by Stephen. The Cathedral was founded in 1096. In the thirteenth century the greater part was burned, and thereafter rebuilt. At the e. end are two original Norman chapels. In the fifteenth century the handsome spire (315 ft.) was erected. Within the precincts are the fourteenth century chapel of St. John (now the grammar school) and the bishop's palace. The largest church, St. Peter Mancroft, is a handsome fifteenth century edifice; St. Andrew's was built in 1506. St. Michael-at-Coslany is an example of fine flint and stone work. St. Andrew's Hall, a handsome Gothic structure, was formerly the nave of the Blackfriars monastery church. The Guildhall (fifteenth century) occupies the site of the Tolbooth. Norwich is noted for its textile fabrics—particularly its crapes. The principal manufactures are, however, those of mustard, starch, and ornamental ironware; p. 126, 207.

**Nose**, the organ of smell, and also part of the apparatus of respiration and voice. Con-

sidered anatomically, it may be divided into an external part—the projecting portion, to which the term *nose* is popularly restricted—and an internal part, consisting of two chief cavities, or *nasal fossæ*, separated from each other by a vertical septum, and subdivided by spongy or turbinated bones projecting from the outer wall into three passages or *meatuses*, with which various cells or *sinuses* in the ethmoid, sphenoid, frontal, and superior maxillary bones communicate by narrow apertures. The margins of the nostrils are usually provided with a number



Section of the Nasal Region, showing the Right Nasal Cavity.

A, Frontal bone; B, nasal bone; C, D, nasal cartilages; E, hard palate; F, superior ethmoidal concha; G, inferior ethmoidal concha; H, inferior turbinate (maxillary concha); I, opening of Eustachian tube; J, opening to sphenoidal sinus.

of stiff hairs (*vibrissæ*), which project across the openings, and serve to arrest the passage of foreign substances, such as dust, small insects, etc. The skeleton or framework of the nose is partly composed of the bones forming the top and sides of the bridge, and partly of cartilages, there being on either side an upper lateral and a lower lateral cartilage, to the latter of which are attached three or four small cartilaginous plates, termed *sesamoid cartilages*. There is also the cartilage of the septum which separates the nostrils, and in association posteriorly with the perpendicular plate of the ethmoid, and with the vomer, forms a complete partition between the right and left nasal fossæ.

The nasal fossæ, which constitute the internal part of the nose, are lofty and of considerable depth. They open in front by the nostrils, and behind they terminate by a vertical slit on either side in the upper part

of the pharynx, above the soft palate, and near the orifices of the Eustachian tubes, leading to the tympanic cavity of the ear. The mucous membrane lining the nose varies in its structure in different parts of the organ. In the upper third of the nose—which, as the proper seat of the sense of smell, may be termed the *olfactory region*—the mucous membrane is very thick and colored by a brown pigment. The olfactory nerve or nerve of smell, terminates in the olfactory mucous membrane. It passes into the nasal cavity in several small branches. These ramify in the soft mucous membrane, and end in tiny varicose fibres which terminate in elongated epithelial cells projecting into the free surface of the nose. There are many diseases peculiar to the nose including Catarrh, Epistaxis, Ozena, Polypus and a number of others.

**Nostalgia, or Home Sickness**, is a variety of melancholia, which is dealt with medically under that heading. On the mental side, there is depression of feeling due to the unsatisfied desire to return home, sometimes delirium. Nostalgia affects armies in foreign countries, probably causing increased susceptibility to other diseases.

**Notables, The**, assemblies of prominent personages, which it was the custom of the kings of France to call together in circumstances of difficulty. Richelieu preferred them to the States-General on account of the constitutional claims of the latter. Louis XVI., in his last struggles with the Revolution, summoned an assembly of notables in 1787, and again in 1788.

**Notary Public, or Notary**, is the title of an officer whose primary function is to grant certificates attesting facts of legal import. At the present day their principal duties consist in receiving and certifying acknowledgments of deeds and other legal instruments; in taking protests of masters of vessels with regard to the weather; in protesting bills of exchange that have been dishonored; in certifying the accuracy of copies of legal instruments, etc. They have also a general authority to administer oaths and take affidavits.

**Notation.** For Chemical Notation, see CHEMISTRY; for Mathematical Notation, NUMBERS, NUMERALS, GEOMETRY, ALGEBRA, QUATERNIONS.

**Notice**, in law, is knowledge of a fact based on information communicated by another. When such knowledge is directly communicated by means of written or spoken

language, it is termed *Actual Notice*. When the law presumes such knowledge to exist—as where notice to an agent is deemed to be notice to the principal—it is termed *Constructive Notice*.

**Notre Dame** (Old French, 'Our Lady'), the name of many churches dedicated to the Virgin Mary in France, particularly the Cathedral of Paris.

**Notre Dame du Lac, University of**, a Roman Catholic institution of learning for men at Notre Dame, Ind., established in 1842, and chartered in 1844.

**Nott, Eliphalet** (1773-1866), American educator, was born in Ashford, Conn. In 1804 he became president of Union College, a position he retained until his death. By his judicious management the College was rescued from financial embarrassment, and attained a high position among American colleges. He took out numerous patents for inventions, including the first stove for the burning of anthracite coal.

**Nottingham**, a city of England, the capital of Nottinghamshire, on the River Trent. Crowning a precipitous rock, which rises 133 ft. above the river, stands the Castle, built in 1674-83, restored in 1878, and transformed into an art museum. Near the town are various caves, formerly used as dwelling places. The Trent Bridge was opened in 1871. Of the various manufactures carried on in Nottingham the most important are those of lace and hosiery. Baskets, bicycles, cigars, and needles are also made, while several iron foundries are in operation, and malting and brewing are extensively carried on; p. 279,000.

**Nottinghamshire, or Notts**, an inland co. of England. Apart from the valley of the Trent, which is flat, the general aspect of the county is undulating and well wooded, the highest ground—600 ft. above the sea level—being in the w., in the vicinity of Sherwood Forest. The Sherwood Forest region, famous as the haunt of Robin Hood, between Mansfield, Warksop, and Retford, is now chiefly enclosed in the group of great parks locally known as 'the Dukeries.' On the Derbyshire border are the Cresswell caves, which have yielded fossil mammalia, besides human remains. The principal mineral products are coal, gypsum, iron ore, and limestone. Rich pasture lands border the Trent. Area, 827 sq. miles.

**Noun**, a primary part of speech including all words used as names. They are classified

as *common*, representing one of a class ('dog'); *proper*, representing a particular person or place ('America'); *collective*, representing a group ('crowd'); *concrete*, representing an object perceptible to the senses ('table'); and *abstract*, representing a quality, state, or process ('kindness').

**Novaculite**, an exceedingly fine-grained sedimentary silicious rock, used for the better grades of whetstones and oilstones. The chief locality is in Arkansas, where the formation is over 500 ft. thick.

**Novæ**, temporary stars appearing suddenly to a brief maximum. The brightest on record flamed out in Cassiopeia on Nov. 6, 1572. Nova Coronæ Borealis, which rose to the second magnitude on May 12, 1866, was found by Sir William Huggins to be enveloped in blazing hydrogen. A number of Novæ have been recognized on the Harvard and Arequipa negatives. Nova Lacertæ, discovered in England, Dec. 30, 1910, was found to have been recorded on the Harvard plates fully a month previous.

**Nova Herculis**, one of the twelve brightest stars in the sky, in the constellation Hercules, was invisible to the naked eye until 1934. Late that year it was discovered to be erupting, though in reality the eruption must have taken place some 1500 years ago, and the rays were just reaching the earth.

**Novara**, town, capital of Novara province, Italy; 28 miles w. of Milan. It has a fifteenth-century cathedral, rebuilt in the eleventh century. The manufacture of silk, cotton, and linen is the leading industry; and there is trade in silk, grain, and wine; p. 44,560.

**Nova Scotia**, the most easterly province of the Dominion of Canada, consists of a long, narrow peninsula and the island of Cape Breton, which is separated from the mainland by the Strait of Canso. The province is bounded on the s. and e. by the Atlantic Ocean; on the northwest by the Bay of Fundy and New Brunswick; and on the n. by the Gulf of St. Lawrence and Northumberland Strait, which separates it from Prince Edward Island. Sable Island is a dependency. The greatest length of the province is 350 miles; greatest breadth, 100 miles. Area, 21,428 sq. miles, including 360 sq. miles of water area. There are many excellent harbors. The ranges of hills are parallel to the coast, the general direction being northeast and southwest. The highest elevations are found in the northern part of Cape Breton. The North and South Mountains, which are parallel to

the Bay of Fundy, enclose the fertile and well-known Annapolis valley. Rivers are numerous, but all small.

As a result of its insular position the climate of Nova Scotia is not subject to the extremes of heat and cold which are usual in the other provinces of Canada. Spring is the most disagreeable season, and is marked by cold winds, rain, and fog. In winter the temperature seldom reaches zero, but the sudden changes are rather trying. The average temperature in summer is 45.6° F.; in winter 25° F. The average rainfall is 38 inches. In summer and autumn the weather is charming. The soil is generally very fertile.

The flora and fauna include the ordinary varieties found in the n. temperate zone of eastern North America. Ducks remain all winter. Geese make only a short stop on their way n. or s. Partridge and woodcock are numerous. The principal wild animals are moose, red deer, bears, and wildcats. Caribou are found in Cape Breton. Salmon and trout abound in the rivers and lakes of the interior.

There are three well defined fishing areas: the inner shoals and ridges from four to five miles seaward, where the typical boat is a high-powered launch of from one to ten tons; the middle grounds; and the great banks, where very fine schooners operate. Since the close of the 15th century 'The Banks' have helped to supply Europe with fish. The supply is 'inexhaustible,' the fisheries being under close supervision by the federal government. A special patrol and medical service is provided in the area of the Lunenburg Grand Banks fleet by a Fisheries Protection cruiser.

The mineral wealth of Nova Scotia is great. The most important mineral product is bituminous coal; gypsum ranks second in tonnage. Iron, gold, lime, salt, diatomite, sand, silica, quartz and clays are produced, and many other minerals are found. Agriculture is the principal industry of Nova Scotia. The insular position of the province and its numerous harbors greatly cheapen the cost of transportation, since no part of Nova Scotia is very distant from tidal water. By birth and tradition Nova Scotians are lovers of the sea. Railway construction has been retarded by the cheap water routes.

The ten leading manufactures are: steel and iron products, pig iron, ferro-alloys, etc.; fish, cured or packed; railway rolling stock; power; biscuits, confectionery, chocolate, etc.; sawmill products; butter and cheese; ships; hosiery, knitted goods and fabric gloves;

printing and publishing. By 1931 census the population was 512,846. The populations of the more important cities were: Halifax, 59,275; Sydney, 23,089; Glace Bay, 20,706; Dartmouth, 9,100; New Glasgow, 8,858.

Education is free, undenominational, and compulsory. In 1939 there were 116,888 enrolled pupils in public day schools. There are 10 degree-conferring bodies: Dalhousie University, at Halifax (Kings College has been a part of Dalhousie since 1923), Acadia University, at Wolfville (these two of university rank); St. Francis Xavier, Nova Scotia College of Agriculture, Nova Scotia Technical College, Holy Heart Seminary, St. Anne, Pine Hill Divinity Hall, St. Mary's College and St. Vincent College. In 1931 the numbers of the leading religious denominations were: Roman Catholics, 161,855; United Church, 110,528; Anglicans, 88,709; Baptists, 82,099; Presbyterians, 48,945.

The government consists of a Lieutenant-Governor, appointed by the Governor-General-in-Council, assisted by an Executive Council responsible to the majority in the legislative assembly, and a Legislative Assembly of 43 members. The province is represented in the Dominion Senate by 10 members, and in the House of Commons by 12 members. The right to vote is conferred upon all British subjects of 21 years and upwards, who have established the required residence. The constitutional government of the province began with the grant of a legislature in 1758, but in 1784 the incoming loyalists formed a separate province, which they called New Brunswick. Nova Scotia was one of the four provinces which united to form the Dominion of Canada in 1867. Consult Philpot, *The Province of Nova Scotia: Resources and Development* (1930); Morse, *Land of the New Adventure* (1932); *Publications of the Nova Scotia Historical Society*; *Chronicles of Canada* (32 vols. 1915-16).

**Novatian**, a priest of the church at Rome in the third century, said to have been a stoic philosopher, but converted to Christianity. The party which espoused his cause was called by his name. They denied the power of the church to absolve from certain sins; completely excluded apostates from all hope of reconciliation with God; excommunicated all who indulged in second marriages; and re-baptized new members.

**Novaya Zemlya** or **Nova Zembla**, an archipelago of the Arctic Ocean, composed chiefly of two islands, divided by the Ma-

tochkin Shar Strait, and belonging to the Archangel government of North Russia.

**Novel.** The word 'novel' (Italian, *novella*) was adopted into the English language when the Elizabethan writers began the imitation of Boccaccio and his school. The term is now usually applied to any fictitious prose narrative which reaches a certain length and contains a more or less complicated plot. A distinction is sometimes drawn in America and Great Britain between the novel and the romance. But romance, as historically known, is the body of tales dealing with Alexander, Charlemagne, or King Arthur, which were written in the vernacular (or romance) languages.

The novel of domestic life, as we now know it, owes more probably to Samuel Richardson than to any other one man. Beginning, almost casually, with the writing of a series of moral letters, he gradually produced his epoch-making *Pamela*, sometimes called the first English novel. Side by side with the 'tales,' this form developed, starting as letters or diaries designed to portray social life, and developing through Frances Burney's *Evelina* to the works of Jane Austen and the French novels.

Meanwhile came the Gothic romance or the tales of terror, which, from its beginnings in Horace Walpole's *Castle of Otranto* and Mrs. Radcliffe's *Mysteries of Udolpho*, reached a high pitch in the works of Matthew Lewis, and its highest development in America, in the genius of Edgar Allan Poe, who was the originator of the detective story. Similar stories by Nathaniel Hawthorne are of deep psychological import. Developing differently from the same source, the tale, Sir Walter Scott gave to literature the historical novel.

Since then the novel may be roughly classified as romantic or realistic, the latter having been in the majority among contemporaneous writers until Hervey Allen's *Anthony Adverse* seemed to show distinct reversal of style. But all excellent novels are hard to classify, as they may mingle psychological realism with romantic plot. The whole question of the legitimacy of utilizing the novel for the presentation of reflections or theories extraneous to the story is one of the moot points of criticism. Meredith tells us it was 'the philosopher who led him on to the building of the three volumes.' And it would be difficult to point to 19th century novelists, whether Hardy, or Balzac, or Zola (the novelist of pure adventure being excluded), whose

works were not moulded and inspired by preconceived theories.

In France the names of Victor Hugo, George Sand, Balzac, Dumas, Stendhal, About, Flaubert, Daudet, Prosper, Mérimée, Zola, Anatole France, Maupassant, Bourget, Pierre Loti, and Romain Rolland attest the popularity of the novel and the weight of intellect which it has attracted into its service. Russia's contribution to realistic fiction has been of extraordinary power and extent, including the works of Gogol, Turgenieff, Dostoevsky, Tolstoy, Gorky, Chekhov, Artsybashev, and Andreev. For more detailed treatment of the novelists of the United States, Great Britain, and Canada, consult the article ENGLISH LITERATURE and UNITED STATES, LITERATURE.

Consult also Cross' *Development of the English Novel*; Mielke's *Der Deutsche Roman*; Saintsbury's *The English Novel*; Van Doren's *Modern American Prose*; Phelps' *Essays on Russian Novelists*; Stephen's *French Novelists*.

Since 1935 the general trend is toward realistic novels dealing with the growing social, economic and political struggles.

Vardis Fisher's trilogy, *In Tragic Life, Passions Spin the Plot and We Are Betrayed* is of the type of literature that has lately produced several distinguished examples of its genre. The story is that of an extremely sensitive boy in revolt against the farm life he was born into. Ruth Suckow in *The Folks* makes an exhaustive study of an ordinary mid-Western family. *Now in November* by Josephine Johnson won the Pulitzer prize for the best American novel published in 1934, and is a study of the effects of the drought on a Missouri farm. Thomas Wolfe has achieved distinction with his broad panorama in *Of Time and the River*. In this novel the author takes his hero from his southern home to Harvard and then on to Paris.

Margaret Mitchell's *Gone with the Wind* has won enormous popularity. It is an historical novel in setting only, its background the Civil War days in the South; its characters are highly realistic in the manner of the modern psychological novel. Another book with an historical setting is Mary Ellen Chase's *Mary Peters*, the story of a Maine seacoast family, and an excellent picture of a past New England. Kenneth Roberts has written a stirring novel of the War of 1812, *Captain Caution*; and Louis Doges's *The American* is an exhaustive work on the days of the pioneers.

George Santayana's *The Last Puritan* is a study of an American boy who, though well endowed, achieves nothing. Sinclair Lewis's *It Can't Happen Here* attempts to show how easily fascism might come to a country as democratic as the U. S. John P. Marquand's *H. M. Pulham, Esquire* (1941) is an ironical and penetrating analysis of the New England character and scene.

In 1942 and 1943 the war shadowed both publishers and writers, but numerous good novels appeared, among them John Steinbeck's *The Moon Is Down*; Lloyd C. Douglas's *The Robe*; and John P. Marquand's *So Little Time*.

**November** (Latin *novem*, 'nine'), was among the Romans the ninth month of the year (the German *Wind* month). See, **YEAR**.

**Novgorod**, government of n.w. Czarist Russia, situated east of the government of St. Petersburg. It covers an area of 45,770 sq. m.

**Novgorod, Old, or Great**, city, Russia. The Kremlin, or citadel, contains the Cathedral of St. Sophia (1045-52; restored 1893-1900). In 1932 the name of the city was changed to "Maxim Gorky" in honor of Russia's foremost writer (q.v.) who was born there.

**Noyeau**, or **Crème de Noyau**, a French liqueur of the cordial class, made from grape alcohol or brandy, sweetened with pure cane sugar and flavored with crushed peachstone kernels.

**Noyes, Alfred** (1880- ), English poet. In 1913 he gave the Lowell Lectures in America, on 'The Sea in English Poetry,' and the following year was elected to a professorship of modern English literature, on the Murray Foundation, Princeton University, from which he resigned in 1923. Among his publications in verse, are: *The Loom of Fears* (1902); *Tales of the Mermaid Tavern* (1912); *The Torchbearers* (1922).

**Noyes, Arthur Amos** (1866-1936), American chemist, graduated from the Massachusetts Institute of Technology in 1886, and served that institution as acting president from 1907 to 1909. In 1915 he became director of the Gates Chemical Laboratory, California Institute of Technology.

**Noyes, Henry Drury** (1832-1900), American ophthalmologist, was born in New York City. He was one of the first surgeons in America to use cocaine as a local anæsthetic in ophthalmic operations. He was a founder of the American Ophthalmological Society, and its president from 1878-1884.

**Noyes, John Humphrey** (1811-86), American perfectionist and communist. In

1848 Noyes removed to Oneida, N. Y., where he established the Oneida Community (see **COMMUNISM**).

**Noyes, William Curtis** (1805-64), American lawyer. With Alexander W. Bradford and David Dudley Field he was in 1857 appointed by the N. Y. legislature, a commissioner to codify the laws of the State. His library was bequeathed to Hamilton College.

**NRA**, National Recovery Administration. See **UNITED STATES, NEW DEAL**.

**Nubia**, a region of Northeastern Africa between the Red Sea and the Libyan Desert, extending south from the First Cataract of the Nile to Dongola and Meroë. Nubia was a part of ancient Ethiopia and was governed by officials of the Pharaohs, until about 1100 B.C., when a native Ethiopian monarchy was established. In 1820, Ismail Pasha annexed the country.

**Nuble**, province, Chile, in the interior, extending on the east to the slopes of the Andes; area, 3,406 sq. m.

**Nucleus**, See **Biology; Cell; Embryology; Protoplasm**.

**Nudism** was born in post-war Germany, where a so-called back-to-nature movement developed with the object of restoring the health of the war-starved generation. The cult spread to France and other European countries, meeting police resistance everywhere, and ultimately reached the United States, where several nudist colonies were established at remote summer camps or in metropolitan gymnasiums whose addresses were kept more or less secret. The Vatican inveighed against the practise as grossly immoral, the Prussian State Police raided colonies before and after the advent of the Nazi regime and the State of New York enacted a drastic law prohibiting three or more people, of opposite sexes, from gathering in one another's presence without clothing.

**Nueces**, river in Southern Texas, rising in Edwards County and flowing in a southeasterly direction for about 310 miles, to Corpus Christi Bay, an arm of the Gulf of Mexico. Its drainage area is 18,944 square miles.

**Nueva Cáceres**, or **Naga**, pueblo, Luzon, Philippine Islands, capital of the province of Ambos, Camarines, on the Naga River, 10 miles from the coast.

**Nueva Ecija**, province, Luzon, Philippine Islands, in the central part of the island, with 23 miles of Pacific coast; area 3,840 sq. m. The soil is fertile, producing corn, rice, tobacco, sugar cane, and coffee. San

Isidro, the capital, is 52 m. n. of Manila; p. 226,000.

**Nueva San Salvador (Santa Tecla)**, city, Salvador, capital of the department of La Libertad, is situated at the foot of the extinct volcano of Nueva Santa Salvador; p. 29,000.

**Nueva Vizcaya**, province, Luzon, Philippine Islands; area 1,075 square miles. Rice is the only crop of importance. Valuable woods and big game are found in abundance. Bayombong, the capital, is 134 miles north of Manila; p. 37,000.

**Nuevo Laredo**, town in Mexico, state of Tamaulipas, on the Rio Grande, opposite Laredo, Texas; p. 15,000.

**Nuevo Leon**, state, Mexico, on the n.e. slopes of the eastern Sierra Madre; area, 25,032 square miles. The climate is generally temperate and the rainfall variable. Monterey is the chief town and the capital; p. 375,000.

**Nuisance**, any unlawful interference with one in the enjoyment of a right of property. The right infringed may be private, as the right to light and air or to a private water-course, or it may be public, as the right to use a highway or a public stream. In the former case the nuisance is private, in the latter it is public. A public nuisance is ordinarily remediable by criminal process instituted by the law officer of the State or city or by summary abatement by the duly constituted authorities. The range of public nuisance has been much increased by modern legislation, and now includes a great variety of acts offensive to the public health or morals.

**Nullification**, in United States history, the act of a State in formally preventing or attempting to prevent the operation of a Federal law within its limits. The right of a State to take such action was asserted in the Virginia and Kentucky Resolutions of 1798-9. In technical constitutional terminology, however, 'nullification' applies primarily to the action of South Carolina in 1832-3 in refusing to be bound by the obnoxious tariff laws of 1828 and 1832. In this case the State acted in accordance with a clearly defined constitutional theory, which was expressed in its classic form by Calhoun. On Nov. 19, 1832, a South Carolina convention, called to take action concerning the objectionable tariff laws, which were considered unconstitutional, adopted the famous 'Ordinance of Nullification'—nullifying those laws. President Jackson issued (Dec. 11) a

counter-proclamation, declaring nullification unconstitutional and 'incompatible with the existence of the Union' and expressing his determination to enforce the nullified laws.

**Nullity of Marriage**. Certain marriages are voidable—*i.e.* they may be declared null and void by a court of competent jurisdiction in proceedings taken by one of the parties to the marriage during the lifetime of both. Unless and until such a declaration has been made, voidable marriages are valid for all purposes. The impediments which render marriages void are not the same in all states, but generally they are as follows: nonage; insanity; consanguinity and affinity, or relationship within the prohibited degrees; previous marriage still subsisting. The New York Domestic Relations Law provides that a marriage is void if the parties are within certain degrees of relationship, or if either has a husband or wife living, unless the marriage has been annulled for some cause other than adultery, or the spouse has been sentenced to life imprisonment, or has been absent and whereabouts unknown for five years last past, in which cases it is voidable. Marriages contracted with the other above-mentioned defects are void only after they have been so declared by a court of competent jurisdiction. The annulment of a marriage places the parties in the same position as they were before marriage, and neither retains any rights as to property or otherwise as against the other; in other words they stand as if no marriage had ever taken place.

**Numa Pompilius**, the second king of ancient Rome, and the successor of Romulus. The traditional date of his reign was from 715 to 673 B.C. He built a temple of Faith. Some authorities regarded him as a mere personification of law (in Greek, *nomos*).

**Numbers**, the fourth book of the Pentateuch derives its name from the fact that it recounts two enumerations of the Israelites. See Gray's commentary (1903); also *HEXATEUCH*, and literature cited there.

**Numbers**. The most fundamental classification of numbers is into prime and composite—the former having no factors except unity and the number itself, while the latter is factorizable into two or more factors differing from unity. Thus 1, 2, 3, 5, 7, 11, 13, 17, 19, 23, etc., are prime numbers; 4, 6, 8, 9, 15, etc., are composite.

**Numerals**. The numerals we now generally use are known as 'Arabic numerals,' because they were borrowed in the 12th

century from the Arabic scholars of Spain. Also in common usage are the Roman numerals.

**Numidia**, country in N. Africa, between the territory of Carthage on the e. and Mauritania on the w., thus forming part of modern Algeria.

**Numismatic and Archæological Society**. An association in the United States, organized in 1858 and incorporated in 1865, for the collection and preservation of coins and medals, and the investigation of matters connected therewith. The society owns large collections of coins and medals and an extensive numismatic library. The headquarters of the society are in New York.

**Numismatics**, the science which treats of coins and medals. Coins are pieces of metal of fixed weight, bearing a government stamp, and used as a circulating medium. Medals are pieces struck—not necessarily by government—to commemorate an event. The metals used are gold, silver, and copper, and alloys of these, such as electrum, which is an alloy of gold and silver, billon, bronze, and potin. The earliest coins were very thick, or ill-shaped pieces, upon which, by means of a hand-punch, a more or less rude impress was struck. The earliest coins were struck in that portion of Asia Minor anciently known as Lydia. As early as 716 B.C. Lydian coins in electrum were in circulation, and continued to be so till 652 B.C. The earliest Greek coins, with the exception of the Lydian, bear as inscription the initial letter of the city of origin; the first coin bearing the name of a king is the tetradrachm of Alexander of Macedon. In Jewish coins three epochs are distinguished. The first, struck at the time of Alexander the Great, were of copper, and are of extreme rarity; the second group were coined by Mattathias, 169 B.C., and were current until the date of Antigone, 37 B.C. The Idumæan dynasty instituted the third, the earliest coins of which were struck in the epoch of Herod the Great 40 B.C., and the latest during the reign of Vespasian, 134 A.D. The coins of the Romans are divisible into three important classes—the republican, the family, and the imperial. Most of the republican coins were of bronze, and belonged to the early period of Roman culture. At about 170 B.C. the family coins came in; these were marked usually by symbols of events occurring in the great family, the members of which had hereditarily held office in the mint. Imperial coins, chiefly in gold and

silver, represent a very great variety in size, and in the style of their execution. With the reign of Commodus the art reached its climax. Copper coins washed with silver were the invention of Gallienus. Mediæval European coins find their most specific representative in the denier, or silver penny. After the municipal corporation had, in the 13th and 14th centuries, begun to issue their own coins, a thin piece, called a bracteate, came largely into circulation, both on the Continent and in England; but there can be no doubt that, centuries earlier, the inhabitants of the British Isles had a coinage of their own. These coins were of silver, and on the very earliest specimens, which are unlettered, the head or the figure of a horse is nearly always present. The coins of the Anglo-Saxon heptarchy range in time from Hengist 454 A.D. to Edgar (959). About 80 different mints are known. These coins consisted of skateas, stycas, heptarchical pennies, and ecclesiastical pennies. All of them are rare, and about 65 are known to be unique. The Hiberno-Danish coinage began with Anlaf I. (853 A.D.), and closed with Magnus, who was slain 968 A.D. In England, the beauty and ornate style of many of the coins of Edward III. are very marked in comparison with previous coinages. Coins of gold called nobles and angels were the special feature of this period. The principal recent feature in the coinage of Great Britain was the issue of the two-shilling piece, or florin, which was regarded as a step in the direction of a decimal system. The earliest American coinage was that of the Virginia company, about 1612. It consisted of shillings and sixpences, only three specimens of which are known to exist, and was called 'Hogge Money' from the figure of a hog stamped on it. In 1652 the first mint was established at Boston and issued the 'Pine-tree money'—shillings, sixpences, and three-pences. Private coinages were established in various states until Congress in 1789 adopted the present system, the first mint being established in 1792. The rarest United States coins are the silver dollar of 1804 and the double eagle of 1849, of the latter only one specimen being known.

**Nun**, a member of a religious order for women, living under rule, and bound by vow to the service of God. The first convent for women was founded (4th century) in the Egyptian desert by the sisters of Sts. Anthony and Pachomius. Besides the ancient contemplative orders for women, the needs



of the church and society in modern times have given rise to various active orders—e.g. Sisters of Mercy and Sisters of Notre Dame. The superiors of the various orders bear the title of mother-general, abbess, prioress, rev. mother, sister-superior. See MONASTICISM.

**Nunc Dimittis**, the name taken from the first words of the Latin version of the song of Simeon. It forms part of evening prayer in the Anglican Church, and it is used in the Greek Church and in the Roman Catholic Church.

**Nuncio**, or **Legate**, a representative of the Pope outside of Rome. Legates are of three kinds: *Legati a latere*, who used to govern papal provinces, or have been sent to other courts on special business; they have been cardinals since the time of Innocent iv. (d. 1254). *Legati missi* or nuncios, regular papal representatives at foreign courts. *Legati nati*, certain bishops or archbishops who claimed the right by virtue of their office; the Archbishop of Canterbury was legate for England until the Reformation.

**Nuremberg** (Ger. *Nürnberg*), town, Bavaria, Germany; 96 m. n.w. of Munich. It still retains its ancient walls and moat, and is one of the richest towns on the Continent in mediæval buildings and works of art. Albrecht Durer, Veit Stoss, Peter Vischer, and Adam Kraft lived and worked here. One of the most notable buildings is the *Burg* or Royal Castle built (c. 1024-1158) by Conrad II. and Frederick Barbarossa. It stands on a rocky prominence at the northern end of the old town, commanding a glorious view of the surrounding country. A remarkable library, dating from 1445, is preserved in the old Dominican monastery, and Durer's home is now the property of the city. Although the foreign commerce of Nuremberg has declined in importance, the city is the chief manufacturing town in Southern Germany. There is a large trade in the town's specialties of metal, wood, and bone carvings, and children's 'Dutch' toys and dolls, which are known as 'Nuremberg wares'. Nuremberg was made a free city in 1219, and retained its independence until 1803, when Napoleon I. bestowed it upon the king of Bavaria. It was from the beginning a Protestant stronghold; p. 431,000.

**Nurse Corps, U. S. Army**, a body of female nurses authorized by Congress in 1901 following the Spanish-American War. Members are appointed and discharged by

the surgeon general of the army with the approval of the Secretary of War, and assigned to duty at hospitals where their services are required to attend sick and wounded officers and soldiers. The Naval branch of the Nurse Corps was established in 1908.

**Nurse Rhymes**, metrical jingles transmitted in folklore and mechanically repeated by children at their play, without knowledge of their significance or origin. Many of them are doubtless survivals among children of May games, ring-songs and dances, rounds, and kissing games which were once played by grown-up people. Consult W. Wells Newell's *Games and Songs of American Children*.

**Nursing**. For centuries religious orders furnished practically the only nursing for suffering humanity. The first great secular nursing orders, as the Beguines of Flanders, and Guy de Montpellier's Order of the Holy Ghost, date from the 12th and 13th centuries; and from that time on, up to the latter part of the 17th century, monastic and semi-monastic nursing bodies multiplied rapidly. The period from the latter part of the 17th century to almost the middle of the 19th is a dark one in the annals of nursing; the care of the sick was left largely in the hands of the ignorant, and hospital conditions were unspeakable. Toward the end of this period, in 1836, an institution for the instruction of deaconesses, under the direction of Pastor Fliedner and his wife Friedericke, was founded at Kaiserswerth, Germany. The training of nurses was made a part of the work, and it is with this undertaking that modern nursing may be said to have begun. In 1840, through the efforts of Elizabeth Fry who had interested herself in the Kaiserswerth project, an Institute of Nursing was established in London. The next step in advance was the work of the early Anglican sisterhoods and this was followed by the epoch-making career of Florence Nightingale, the founder of modern professional nursing. In recognition of Florence Nightingale's achievements in the Crimean War a sum was raised by the British public for the establishment of the Nightingale training school. This undertaking attracted widespread attention, similar schools were established in London and elsewhere, and the profession of nursing was at last established on a sound basis. The last seventy years have seen also the organization and growth of the Red Cross, and the in-

creasing extension of nursing into the field of social service. In the United States, as early as 1798 Dr. Valentine Seaman inaugurated in the New York Hospital a course of 24 lectures for nurses, including outlines of anatomy, physiology, and the care of children. In 1839 the Nurses' Society of Philadelphia was organized, and in 1863 the Woman's Hospital, Philadelphia, received its first pupils. The New England Hospital for women and children established a course of training in 1860, and in 1872 opened the first modern training school in the United States. During the following year schools were established at Bellevue Hospital, New York City, the New Haven Hospital, and the Massachusetts General, Boston, and from these beginnings has grown the vast chain of schools for nurses' training throughout the United States. As in Europe, so in America, the recent history of nursing has been one of constantly rising standards. The first State registration law was enacted by North Carolina in 1903.

**Hospital Training**—The course of training for nurses varies with different hospitals, as do also the requirements for admission. In general, applicants must meet certain educational requirements, must be of average height and weight and of strong physique, and must furnish references as to their mental and moral qualifications. The course varies from two to four years. Upon completion of the course and passing of the final examinations, a diploma is granted.

**District or Visiting Nursing** dates back to 1859, when William Rathbone of England first put into operation the idea of utilizing the services of trained nurses to visit the homes of the people, giving relief especially to the sick poor. The first work along this line in America was begun in 1879 under the auspices of the Woman's Branch of the New York City Mission. The movement grew slowly at first, but with the general growth of ideals of social betterment in recent years it has become firmly established. The Henry St. Settlement in New York is one of many charitable organizations doing this type of work.

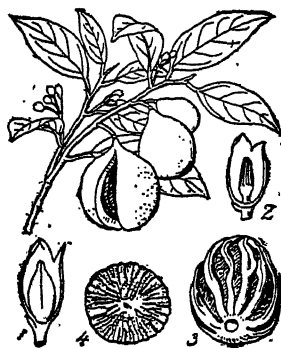
**Nut**, in popular language the name given to all those fruits which have the seed enclosed in a bony, woody, or leathery pericarp, not opening when ripe. Among the best known and most valuable nuts are the hazel nut, brazil nut, walnut, chestnut, and coconut, all of which are edible. As a food, nuts are even more concentrated than cheese,

but they may be rationally used to form part of a well-balanced diet.

**Nutation**, in botany, a phenomenon whereby the stems, leaves, and other parts of growing plants are inclined successively in different directions.

**Nutation**, a slight oscillatory movement or 'nodding' of the earth's axis, which disturbs the otherwise circular path described by the pole of the earth round that of the ecliptic, known as the 'precession of the equinoxes' (See PRECESSION). It was detected by Bradley, about 1727, and definitively described in 1748. It is chiefly due to an inequality in the moon's action on the earth's equatorial protuberance.

**Nuthatch**, a genus of small passerine birds belonging to the family Sittadæ, allied to the tit and represented throughout the North Temperate Zone in wooded districts. The nuthatch are climbing birds, and spend nearly all their time scrambling about head downward. The common North American nuthatch (*Sitta carolinensis*) or white bellied nuthatch, is about 6 in. in length, bluish-slate above, with blackish markings on the wings and a black cap and nape, and pure white below. A more northerly form is the smaller red-breasted nuthatch (*S. canadensis*). Other North American species are the brown-headed nuthatch (*S. pusilla*) of the South Atlantic and Gulf States, and the pygmy nuthatch (*C. pygmaea*) of the Pacific slope.



*Nutmeg (Myristica fragrans)*

1. Section of female flower. 2. Section of male flower. 3. Seed in mace (aril). 4. Cross section of seed (nutmeg).

**Nutmeg**, the kernel of the fruit of several species of *Myristica*, especially *Myristica fragrans*, an evergreen tree, with dark glossy leaves, native to the Molucca Islands and

largely cultivated in the tropics, especially in South America and the West Indies. The fruit is similar in size and general appearance to a pear, and contains the kernel enveloped in a curious yellowish-red aril, which constitutes the mace of commerce. Nutmegs are principally used as a flavoring spice, and are added in a grated form to foods and drinks. The volatile oil is of use as a carminative.

**Nutmeg State**, a popular name for Connecticut, which was said to have manufactured wooden nutmegs.

**Nutrition**, or the process by which the human organism appropriates materials for the promotion of growth and repair of waste, depends not only upon the digestion and absorption of food, but also upon the more remote functions of respiration, circulation, secretion and excretion. In a highly organized individual like man the blood and lymph carry oxygen and pabulum to the individual cells, while the secretions of the various glands connected with the alimentary system transform the food into compounds which may be either stored up for future use or poured directly into the blood stream. If an amount of food in excess of the needs of an organism be digested, the surplus may be stored in adipose tissue, but it no longer leads to multiplication of the cells. In order that nutrition may proceed normally, normal blood conditions must be present, the part to be nourished must be able to assimilate the material needful to its growth, and the food supplied must contain the proper elements to maintain health and strength. See DIET and DIETETICS; DIGESTION; FOOD.

**Nux Vomica**, the seed of a small tree, *Strychnos nux vomica*, belonging to the order Loganiaceæ, a native of India, Persia, and north of Australia. The tincture of nux vomica is made by exhausting two ounces of the finely powdered seeds with one pint of rectified spirit. The strychnine, which pervades all parts of the plant, is a colorless, odorless, bitter crystalline body, and is a powerful stimulant of the respiratory center, the circulation, the digestive tract, and the central nervous system. Given in proper doses, strychnine is useful in atonic dyspepsia, atonic constipation, in conditions attended with difficult breathing, in certain infectious diseases, and in various forms of heart failure.

**Nyangwe**, trading centre, Belgian Congo, Central Africa, on the right bank of the

Congo, or Lualaba. It was the starting point of Stanley's descent of the Congo in 1876.

**Nyasa**, large lake, Tanganyika Territory, South East Africa. It extends 350 miles from north to south and has an area of about 14,000 sq. m. At the southern end its waters issue into the Shire.

**Nyasaland, German**, that part of the former German East Africa adjoining Nyasa Lake on the north and northeast now included in Tanganyika Territory.

**Nyasaland Protectorate**, British colony, East Africa, known until 1907 as British Central Africa. See BRITISH CENTRAL AFRICA PROTECTORATE.

**Nyctalopia**, in medicine, night-blindness, failure or imperfection of vision at night or in dim light with ability to see well only in strong daylight.


**Nye, Edgar Wilson** (1850-96), American humorist, was born in Shirley, Me. His first humorous articles were written for the *Cheyenne Sun* over the pseudonym 'Bill Nye,' and he used this signature thereafter in his writings. In 1886 he settled in New York City, where he afterward wrote chiefly for a newspaper syndicate. His publications include *Bill Nye and the Boomerang* (1881), and *Comic History of England* (1896).

**Nylon**, a synthetic, proteinlike substance, derivable from coal, air, and water. Its filaments are used in knitting hosiery, underwear, etc. It may also be fashioned into bristles or sheets. During World War II, when silk was unobtainable, nylon was used for parachutes, tow ropes, bomber tires, etc.

**Nymphææ**, in ancient Greek mythology female deities of woods and streams. They are divided into Oceanides, nymphs of the outer ocean; Nereides, nymphs of the sea; Naiades, nymphs of the rivers; Oreades, nymphs of the mountains; Alseides and Napææ, nymphs of valleys and glens; Dryades or Hamadryades, nymphs of trees.

**Nymphæa**, a large genus of beautiful aquatic plants, which includes the water-lily family. The nymphæas, in cultivation, are roughly divided into the hardy, surviving winter, out-of-doors, if covered with sufficient water, and the tender, needing protection.

**Nyssa**, a genus of trees belonging to the order Cornaceæ. They have a characteristic habit of growth, with more or less twisted and knotted, horizontal or drooping branches. *N. aquatica* and *N. biflora* are called 'tupelo,' while *N. sylvatica* is the 'pepperidge' or 'sour gum.' They all prefer swampy soil for a habitat.

**O**, the fifteenth letter of the English alphabet, is the only letter which cannot be traced to the Egyptian hieroglyphics. It is believed to have been an ideographic picture invented by the Semites to express a sound only found in Semitic languages. This supposition is supported by the correspondence of its Semitic name, *ayin* which means an 'eye,' with its oldest form , which may be regarded as the picture of an eye. The Greeks, who took over the Phoenician alphabet, having no corresponding sound in their language, used the symbol for the vowels *ō*, *ou*, and *ō*, which they required. In the earliest Greek inscriptions *O* represents all three sounds. About 550 B.C. the symbol was differentiated, the closed form, *o*, called *omicron*, or 'little *o*,' being appropriated for the short *ō*, while it was opened out at the bottom, to represent the long *ō*, which was called *omega* or 'great *o*.'

Modern English long *o* is a diphthong (Murray, *ou*). When it was a simple vowel it probably fluctuated, as it does in most languages, between the 'narrow' and the 'wide' sounds (Murray, *o* and *o*). In a general scientific notation it may include both (mid back round). Modern English short *o*, as in 'not,' is neither of these (low back wide-round). English *o* needlessly represents several other sounds for which other signs are available. Since the 15th century it has acquired the value of *u* (as in 'do'). To denote this sound it is generally written twice (as in 'good'). It also shares with *u* the representation of the sound in 'son,' 'love,' etc. Before *r*, as in 'word,' it has a sound common to all the vowels except *a* (cf. 'bird,' 'serve,' etc). See ALPHABET.

**Oahu**, the most important island of the Hawaiian group, lying n.w. of the island of Hawaii, with an area of 598 sq. m. Honolulu, the capital of the islands is situated on the southern coast; p. 144,018. See HAWAIIAN ISLANDS.

**Oak** (*Quercus*), a genus of trees and shrubs of the family Cupuliferae, including about 300 species native to the temperate and tropical regions of the Northern Hemisphere. Oaks are especially numerous in North America, while

many varieties occur in Europe and Asia. The different species vary in size from dwarf bushes to stately forest trees, 50 to 100 or even 150 ft. in height, and 4 to 8 ft. in diameter. They are extremely long lived, most varieties probably requiring a century to reach maturity. The fruit is a round nut, or *acorn*, protruding from a woody, truncated cup formed by the enlarged scales of the involucre; the leaves are alternate and simple, with entire, lobed, or sinuate margins, deciduous in most varieties, but evergreen in some.



Oak (*Quercus robur*).

1, Male flower; 2, Female flower.

The timber of the oak is strong, durable, hard, elastic, and peculiarly resistant to moisture. It has been used for shipbuilding since the 9th century, and is also extensively employed in architecture, cabinet making,

carving, mill work, and coopering. The bark contains *tannin*, employed in tanning, and a bitter principle known as *quercine*, used in medicine as a tonic and astringent.

The White Oak (*Quercus alba*) is the most important of the American species. The principal European species is the British Oak (*Q. robur*), including the two subspecies, *Q. pedunculata* and *Q. sessiliflora*. These trees are among the largest of the genus.



A Railroad Station in Oakland.

*Oak Galls* are abnormal or diseased growths produced on the oak by certain insects and fungi. A large number are due to hymenopterous insects, known as Cynipidae of *gall flies*. Consult J. E. Rogers' *The Tree Book*; C. Mosley's *The Oak* (1910).

**Oakland**, city, California, a port of entry and the county seat of Alameda co., situated on the mainland side of San Francisco Bay, facing the Golden Gate, 6 m. e. of San Francisco, with which it is connected by bridge and ferries. The great basin, forming the world's largest land-locked harbor, accommodates vessels of deepest draught. It is improved with breakwaters at the entrance, government jetties on the w., and other improvements, giving the city 27 m. of deep-water frontage on which are located ample docks and terminals, as well as shipbuilding establishments and fully equipped repair plants. Gently sloping foothills, rising to a height of 1,500 ft., form the background for the city and furnish a magnificent residential district. Due to its close proximity to San Francisco Bay and the Pacific Ocean, Oakland enjoys a genial, equable, and healthful climate, with a mean average temperature of 57.1°. The University of

California is situated in Berkeley, which adjoins Oakland on the north. Its central position on the Pacific coast, with adequate rail and water facilities, ample industrial acreage, and its equable working climate have all contributed to the city's unusual growth. Cheap and abundant fuel oil is obtained from the nearby oil fields, and a superabundance of hydro-electric power supplies heat, light, and power to the city and to other sections of the State. The leading industries are: shipbuilding and steel products; canning and preserving; lumber and timber products, and electrical machinery; the population of Oakland is 302,163.

**Oakley, Violet** (1874- ), American mural painter and designer, was born in New York City. She is best known for her mural paintings and stained glass windows. Her work includes the series of thirteen panels on the *Founding of the State of Spiritual Liberty* and nine panels entitled *The Creation and Preservation of the Union* in the State Capitol at Harrisburg, Pa.; and decorations for the Church of All Angels, New York City. She received a gold medal at the St. Louis Exposition (1904), a gold medal from the Architectural League of New York in 1916, the Philadelphia prize, Pennsylvania Academy of Fine Arts (1922), and numerous other prizes.

**Oakum**, originally the coarse part of the flax when separated by hackling, but now signifying the fibre obtained by untwisting and picking out the loose threads of tarred hempen rope. The principal uses of oakum are for caulking ships' seams and stopping leaks, and in the dressing of wounds. *White oakum* is manufactured from untarred rope.

**Oasis**, a fertile spot in a desert, due to the presence of wells or of underground water supplies. The best known and most historically famous oases are those of the Libyan Desert and the Sahara. The French have created many oases in the Algerian deserts by sinking artesian wells. See *DESERT*.

**Oates, Titus** (1649-1705), English conspirator, was born in Oakham. In concert with a fellow clergyman, Israel Tonge, he concocted what is known in history as the *Popish Plot*; and after feigning conversion to Catholicism in June, 1678, he communicated to the authorities the pretended plot. Charles treated the story with contempt; but Oates swore to the truth of it before a magistrate, Sir Edmund Berry Godfrey, who soon afterward was found murdered. Oates became the hero of the day, but after two years a reaction set in, and in May, 1685, he was found guilty

of perjury, and sentenced to be pilloried, flogged, and imprisoned for life. The Revolution of 1688 gave him liberty and a pension.

**Oat Grass**, popular name for any one of several grasses resembling the common oat. *Arrhenatherium elatius* (or *Avenacenum*), the Tall or Meadow Oat Grass, is grown in the Eastern and Southern United States for hay and pasturage. Black Oat Grass is *Stipa avenacena*, a smooth American perennial.

**Oath**, in the legal sense, may be defined as a solemn appeal to God to witness the truth of a statement or the sincerity of a promise, coupled with an imprecation of divine judgment in the event of falsehood or breach of obligation. An oath to the effect that a statement is true is required of all witnesses in judicial proceedings and in other circumstances as defined by law: where a person is compelled to swear that he has no smuggled goods in his possession. An oath such as that last mentioned is commonly called *assertory*; those required by courts of justice are termed judicial.

Oaths to the effect that something shall be done or a certain line of conduct followed out may be illustrated by the *oath of allegiance* required by aliens on naturalization, or the *oath of office* required from those holding public appointments. Such oaths are termed *promissory*. At common law it is essential to the validity of an oath that the person taking it believes in the existence of a Supreme Being who will punish perjury or failure to perform a duty solemnly undertaken. The regular method of administering an oath at common law is for the officer to repeat the form to the affiant in the second person thus: 'You do swear that,' concluding with the words 'So help you God.' The affiant meanwhile holds in his hands a copy of the Gospels, and afterward kisses it.

In the United States, the association of oaths with the idea of divine retribution has for the most part been discarded, and a person may either swear or solemnly affirm in any way which he declares will bind his conscience, whether he believes in a Supreme Being or not. (See **AFFIRMATION**.)

**Oath, Ephebic**, an oath of civic allegiance taken by the youth of ancient Athens after the completion of his secondary education, and before entering upon his two years of military training. An adaptation of this oath is now formally administered to the graduates of the College of the City of New York.

**Oath, Hippocratic**, an oath said to have been administered by Hippocrates to his disciples, and still administered in certain universities to candidates for a degree in medicine.

**Oats**, (*Avena*), cereal grasses of the order Gramineæ, from which is derived one of the most important crops of edible grain. They grow best in cool, moist climates, and reach their highest development in the United States, Russia, Germany, France, Austria, Sweden, Great Britain, Canada, and the Argentine Republic.

**Varieties**.—The common Oats (*A. sativa*), including more cultivated varieties than all the other species together, have several joined hollow culms or stems, averaging about 3½ ft. in height, and bearing spreading panicles or heads from 8 to 12 inches long. The grain itself is borne on small branches of the panicle, in spikelets enclosed loosely within the outer glumes or chaff. The individual kernels are tightly enveloped within the flowering glumes or hulls, which may be white, yellow, reddish brown, or black, according to the variety. In the Northern United States the crop is sown early in the spring, while in the Southern States fall sowing is usually practised. In the rotation of crops, oats follow almost any crop except grass or clover. Harvesting begins when the grain is in the hard dough stage. From 30 to 60 bushels per acre are secured on good soils and in favorable seasons. In the Northern Pacific and Rocky Mountain States, 100 to 125 bushels per acre is not uncommon under irrigation. Oats are used principally as food for horses, but are also fed to cattle, sheep, and poultry. Certain varieties are extensively employed as a cereal breakfast food in the form of *oatmeal* and *rolled oats*. Oat straw is used in mixed feed, for bedding, and in manure.

The most common diseases attacking oats are the crown and stem rusts (see **RUST FUNGI**) and the loose and covered smuts (see **SMUT**).

**Oaxaca**, or **Oajaca**, Pacific state, Mexico, occupying the southern part of the Isthmus of Tehuantepec; area, 35,383 sq. m. The northern part of the state is traversed by the Sierra Madre del Sur (highest peak, Zempoaltepetl, 11,145 ft.) whose slopes are covered by forests of valuable woods. There are many swiftly flowing rivers, and the state is noted for its fine scenery. The climate ranges from the tropical heat of the coast lands to the coolness of the high mountain valleys. Mineral wealth abounds, but is comparatively undeveloped. The chief products are sugar, cotton, tobacco, coffee, cacao, indigo, cochineal, and dyewoods. Cattle raising is carried on. Capital, Oaxaca. P. 1,070,000. See **MEXICO**.

**Oaxaca**, or **Oajaca**, city, Mexico, capital of Oaxaca state; 225 m. s.e. of Mexico City. It is the seat of the government buildings and the

State Institute of Arts and Sciences, and contains a large cathedral, bishop's palace, and the Museum of Antiquities and Natural History. In the vicinity are important ruins of ancient Mexican civilization. The city, founded in the fifteenth century, was the ancient capital of the Zapotec Indians, and was occupied by the Spaniards in 1522; p. 27,796.

**Ob.**, abbreviation for the Latin *obiit*, 'died.'

**Ob**, or **Obi**, one of the great rivers of Siberia, draining about 1,300,000 sq. m., rises in two branches, the Biya and the Katun, both of which have their origin in the Altai Mountains, within the frontier of the Chinese dominions. It flows n.w. and n., through the governments of Tomsk and Tobolsk, for about 2,500 m. to the great Gulf of Ob in the Arctic Ocean.

**Obadiah** ('servant of the Lord'), the shortest book of the Old Testament, the work of one of the Minor Prophets, about whom nothing is known. The book falls naturally into two well marked divisions, of which the first denounces destruction to Edom, and the second prophecies that United Israel shall be restored, and the kingdom shall be the Lord's.

**Obeah**, **Obeeyah**, **Obia**, and **Obi**, the name given by the negroes of West Africa and of the West Indies to the sorcery practised by their witch doctors, and also applied to the charms or fetiches used in that sorcery. See JU-JU; VODOOISM.

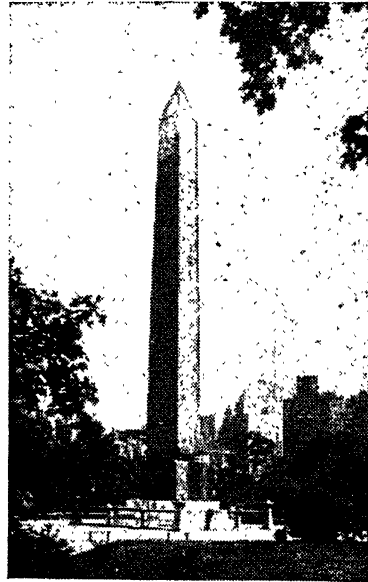
**Obelisk**, a four-sided monument, usually hewn out of a solid piece of stone, and terminating in a pyramidal or pointed top. Their height varied from a few inches to upward of 100 ft.

Obelisks date as far back as the Fourth Egyptian Dynasty (3908-3721 B.C.), and were continued down to Roman times. The two most famous, popularly known as *Cleopatra's Needles*, formerly stood at Heliopolis, and were later re-ornamented by Rameses II. at Alexandria. Thence, in the 19th century, they were brought, one to the Thames Embankment, London, and the other to Central Park, New York City, where they now stand. (See CLEOPATRA'S NEEDLES.) The name *obelisk* is now popularly bestowed upon any similar upright monument, especially the Bunker Hill Monument in Boston, Mass., and the Washington Monument in Washington, D. C.

**Oberalp Pass**, (6,733 ft.), leads from Andermatt, in the Swiss Valley of the Reuss, at the northern mouth of the St. Gothard Tunnel, to Disentis, in the Vorder-Rhine Valley, and so down to Coire. It forms, with Furka Pass the great route for travellers bound from Zermatt

and the Simplon to the Engadine and Coire. See ALPS.

**Ober-Ammergau**, village, Upper Bavaria; 45 m. s.w. of Munich. It is famed for its Passion Play, which originated in 1633, and which takes place every tenth year (see PASSION PLAY). Wood and ivory carvings are produced; p. 1,600.



*Obelisk: Cleopatra's Needle.*

**Oberhausen**, town, Prussia, in the Rhine province; 20 m. n.e. of Düsseldorf, and 35 m. n. of Cologne. In recent years it has grown into an important manufacturing centre. Extensive coal, zinc, and iron mines are worked nearby; p. 110,000.

**Oberland**, the name given to the district comprising the canton of Berne, Switzerland, s. of the Lake of Thun, with the parts of Uri and Unterwalden that adjoin it.

**Oberlin**, village, Ohio, in Lorain co., on the Black River; 30 m. s.w. of Cleveland. It is chiefly a residential place, and is the seat of Oberlin College; p. 4,305.

**Oberlin**, **Jean Frédéric** (1740-1826), Lutheran clergyman and educator, was born in Strassburg. He became pastor at Ban-de-la-Roche, in the desolate Steinthal region of the Vosges Mountains, Alsace, and did much to improve the physical condition of the region, besides exercising an elevating influence upon the moral and intellectual status of his people.

He openly approved of the revolutionary tendencies in France, and as a result many political and social exiles found their way to the Steinthal. He spent his entire life at Ban-de-la-Roche, and was buried there. The Royal Agricultural Society of France bestowed a gold medal upon him in 1818. Oberlin College was named after him.

**Oberlin College**, a non-sectarian, co-educational institution of learning, established in 1833 by John J. Shipherd and Philo P. Stewart, at Oberlin, Ohio, the institution and the village being founded simultaneously, and named after the Alsatian philanthropist, J. F. Oberlin. The school was chartered as the Oberlin Collegiate Institute, the present name being assumed in 1850.

**Oberon**, king of the fairies, who, under the names of *Alberon* or *Auberon* (French) and *Alberich* (German) plays an important part in the fairy lore of the Middle Ages.

**Obesity**, or **Corpulency**, an abnormal development of fat, tending to accumulate most deeply in the buttocks, thighs, neck, and abdomen, both in the walls and the folds of the peritoneum, also about the heart, liver, and kidneys. A certain degree of fatness is quite compatible with health, and it is only when the fatness begins to interfere with the discharge of any of the vital powers that it can be regarded as a morbid condition. Obesity may occur at any period of life, but it is most common after the fortieth year.

The causes of obesity may be divided into two ill-defined groups, the exogenous and the endogenous. In the exogenous group may be placed those in which the only discoverable cause is a racial or body type or hereditary predisposition, contributory factors being sedentary occupations, faulty dietetic habits and the like. The exogenous types involve constitutional inability to properly balance the chemical ratio in the body tissue. Such excessive obesity points to a deficiency in metabolism, which prevents the excretion of unwholesome waste products, so tending to ill health, or to a disorder of the endocrine glands. The mechanism of the latter type of endocrine disorder is still obscure.

Treatment must be suited to each case; in the exogenous type diet and exercise must be carefully regulated. An important point is the avoidance of too rapid reduction of fat. What one should aim at is the steady loss of a very few ounces in the week, the amount of reduction being regulated by the age, weight, and general health.

**Obiter Dictum** (plural *obiter dicta*) a pass-

ing remark of a judge having no legal authority, but containing an opinion worthy of consideration. The word is often used in a general sense for the opinions of men of note on subjects which they are not supposed to have studied as experts.

**Object**, and its correlative, **Subject**, are terms used in a perplexing number of meanings. Thus, it may be said that while ordinarily the *subject* is the knowing mind, the *object* is that which is known, thought, felt, seen, imagined. In general, however, that is objective which deals with the external world, and that subjective which is mainly based on introspection of mental states. See **SUBJECT**.

**Oblates** (Latin *oblatus, oblata*, 'offered up') religious bodies in the Roman Catholic Church, differing from the orders in not being bound by the vows of the religious profession. The institution of oblates was one of the reforms introduced by St. Charles Borromeo, who founded the Oblates of St. Ambrose in 1578. The Oblates of Mary Immaculate, founded at Marseilles in 1815, have about seventy houses, many of them in the United States, Great Britain, and Canada.

**Obligation**, a term in jurisprudence commonly employed in a general sense to denote a binding recognition of a legal duty by a person, or a duty or liability imposed by law. It is therefore a broader term than contract. An obligation may be incurred either in a personal or a representative capacity. See **CONTRACT**; **NEGLIGENCE**.

**Oboe**, (French *hautbois*, German *hoboe, hochholz*), a treble reed musical instrument, to which the bassoon may be said to be the bass. Its reed is double, and consists of two thin blades of cane attached by silk thread to a short metal tube. It is one of the most complicated and intricate of wind instruments; is made variously of boxwood, ebony, cocoa wood, and silver, having holes for the fingers and usually fifteen keys, besides two automatic octave keys to assist the higher notes. *Oboe* is also the name of a treble stop on the organ, its bass being the *bassoon*.

**Obok**, or **Obock**, district on the Red Sea, about 125 m. s.w. of Aden, part of the French Somali Coast Protectorate; area, 2,300 sq. m. The seaport of Obok, acquired by France in 1862, has since 1896 been superseded by Jibuti.

**Obolus**, an ancient Greek coin, made of an alloy of silver and copper, in value equal to the sixth part of a drachma, or between three and four cents in United States money.

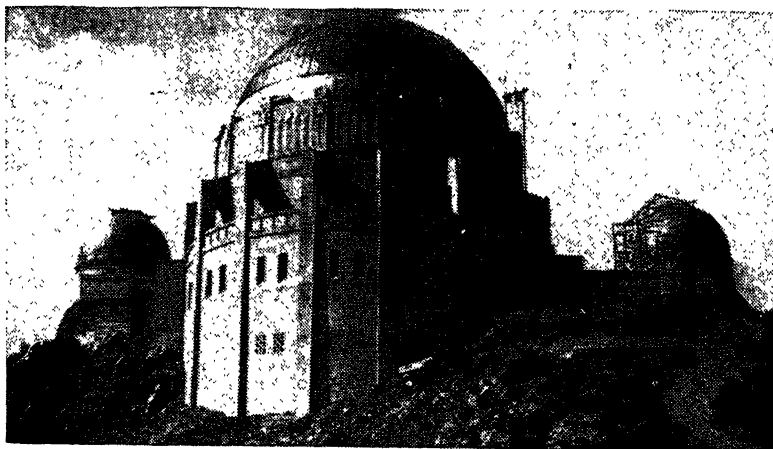
**Obregon**, **Alvaro** (1880-1928), Mexican public official, was born in Sonora. In 1912 he



joined the Carranza revolt and organized a force of Yaqui and Maya Indians, and in 1914 led the victorious Constitutionalist army into Mexico City. Soon after he took the field against Villa, who aspired to the presidency, and after defeating him was made Minister of War and was sent to the United States border, where he carried on negotiations for the withdrawal of U. S. forces which had been sent there under General Pershing. In 1920 he was elected President of Mexico, serving until 1924 when he stepped aside for Calles, and in July, 1928 was again elected president but was assassinated a short time after.

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*Griffith Observatory, near Hollywood, Cal.*

**Obscenity**, in law, is the offence of corrupting or attempting to corrupt public morals, either through indecent personal conduct or words, or through the exhibition or publication of immoral pictures, prints, or books. In the United States, both Federal and State statutes have been passed, extending and amplifying the provisions of the common law on such matters. See INDECENCY.

**Obscurantists**, the name given to those who are supposed to look with dislike and apprehension on the progress of knowledge, especially to such as defend theological prejudices against what is believed to be scientific truth.

**Observantists** are the members of a rigorous class of Franciscan monks who in the 15th century separated from the milder class, the Conventuals. See FRANCISCANS.

**Observatory**, a scientific establishment for observing, primarily, the heavenly bodies, and, secondarily, magnetic and meteorological phenomena. The history of observatories goes

back to the times of the ancient Babylonians and Egyptians, but the earliest observatory of which we have any accurate record is the one founded at Alexandria, about 300 B.C. The commencement of the modern epoch was marked by the foundation of the Observatories of Paris and Greenwich, in 1667 and 1675, respectively.

As early as 1825 John Quincy Adams urged upon Congress the foundation of a national observatory; but it was not until 1843, that the first observatory worthy of the name was established in the United States, at Cincinnati. The effective activity of the United States Naval Observatory began in 1845, and ever since it has done splendid and important work (see NAVAL OBSERVATORY, U. S.). Attached to Princeton University are two observatories, the Observatory of Instruction, erected in 1877, and the Halsted Observatory established in 1883. The University of California is the possessor of the famous Lick Observatory, in operation since 1888. The Smithsonian Institution opened its Astrophysical Observatory at Washington, D. C., in 1890 (see SMITHSONIAN INSTITUTION). In 1894 Prof. Percival Lowell established the Lowell Observatory at Flagstaff, Ariz.

The Yerkes Observatory of the University of Chicago, opened in 1897, is situated at Williams Bay, Wis. In 1904 the Carnegie Institution installed a solar observatory at Mount Wilson, Cal., at an altitude of 5,900 ft. (see MOUNT WILSON SOLAR OBSERVATORY). In 1939 the California Institute of Technology installed the great new 200 inch reflecting telescope on Palomar Mountain, Cal.

In early times the Greek astronomers fixed the positions of the heavenly bodies by means of the Armillary Sphere and the Astrolabe. Ptolemy made use of a Quadrant; and many centuries after, Tycho Brahé converted this form of instrument into an Altazimuth. The Refracting Telescope and the Reflecting Telescope were first employed in the 17th century to make celestial observations (see TELESCOPE). It was not till the middle of the 18th century that the improvement of the clock by Graham enabled astronomers to rely on it for the determination of right ascensions by the times of passage across the meridian by means of a Quadrant, later displaced by the Mural Circle. Roemer invented the Transit. In modern observatories the transit and mural circle are combined into one instrument, the Transit Circle (see TRANSIT). An important auxiliary to the transit circle is the Chronograph, an American invention.

In recent years, spectrum analysis, photography, and photometry have been introduced in observatory work. The most important work of an observatory, however, consists in reducing and publishing its observations. National observatories are usually charged with the distribution of time signals, and the rating of chronometers for the navy.

**Obsidian**, a natural glass—the vitreous condition of an acid lava. It is hard and brittle, with remarkably vitreous lustre, and perfectly conchoidal fracture.

**Obstetrics**, called also **Midwifery**, is the branch of medical science and practice concerned with the study and care of women during the processes of pregnancy, parturition and the puerperium, or lying-in. As a department of medical study it embraces the anatomy and physiology of the female organs of generation, the phenomena of conception and pregnancy, of labor, normal and abnormal, and of the puerperium and the return of the organs to their non-pregnant condition. In the fourth century a remarkable book was published by Moschion. From this time until the beginning of the 16th century it may be said that obstetrics made no progress.

While all ordinary labors were managed by women, the surgeons were called in to assist when a difficulty arose. In 1668 Mauriceau published his *Treatise*, which was long the standard work on the subject. In the 17th century the forceps was invented by Dr. Peter Chamberlen, since modified and elaborated, and no single invention has been more successful in saving life and relieving suffering.

In 1847 Sir James Simpson first employed chloroform anesthesia to relieve the pain of labor, another of the beneficent advances. Various anesthetics have since been used, one of the most successful being an obstetrical analgesia first employed in the Lying-In Hospital in New York. (See ANESTHESIA.)

Till 1870 the great scourge of maternity hospitals, as well as a frequent cause of disaster in private practice, was the prevalence of outbreaks of *puerperal infection* or *septicemia*. In that year the teaching of Lister began to influence obstetric practice, and since then rigorous antisepsis is the rule in all maternity hospitals. (See PUERPERAL INFECTION.)

In 1915 the Public Health Council of the New York State Department of Health established regulations governing the practice of midwifery, prescribing the qualifications of those wishing to practice, and licensing only such women as are found duly qualified. See LABOR; PREGNANCY.

**Obstruction, Intestinal**, is a condition in which the contents of the intestinal canal are obstructed in their onward passage by conditions arising within the abdomen or pelvis. The condition is a serious one, and, if not speedily relieved, is usually fatal. The most common causes are as follows: strangulation by bands of fibrous tissue, resulting from previous inflammation of the peritoneum; a twisting of the intestine on itself, known as *volvulus*; an invagination of one part of the bowel, *intussusception*; stricture from new growths or ulceration; and confirmed constipation. See INTUSSUSCEPTION.

**Ocarina**, a small Italian toy instrument of flute-like sound, made of pottery, and shaped like the body of a bird without head or neck.

**O'Casey, Sean** (1884- ), Irish playwright and author. The revolt of 1916 supplied him with the subject of one of his plays, *The Plough and the Stars* (1926). His other plays are: *Shadow of a Gunman*; *Juno and the Paycock*; *The Silver Tassie*; *Within the Gates*. Characteristics of his drama are powerful realism and profound pessimism.

**Occident**, the West; originally Europe as opposed to Asia and the Orient. It now applies also to the Western Hemisphere.

**Occlusion** is the power possessed by solids of absorbing gases, first observed by Deville and Troost. It depends largely on the area of the surface exposed, and varies with the kind of solid and gas. In general, occlusion appears to be of the nature of a molecular attraction, though in some cases, at all events, a definite

chemical compound seems to be formed. See ABSORPTION.

**Occultation**, the temporary concealment of a star or a planet by the interposition of the moon or another planet. The maximum latitude of stars that can be occulted by the moon is  $6^{\circ}39'55''$ . Observations of these phenomena are highly important for the correction of lunar theory, and, when made at places remote from one another, afford accurate measures of their differences in longitude. See ECLIPSE.

**Occultism**. See Magic; Alchemy; Astrology; Theosophy.

**Ocean and Oceanography**. The ocean is the continuous body of water which covers 72 per cent. (five-sevenths) of the earth's surface (about 142,000,000 sq. m.) to an average depth of about 11,500 ft., the greatest depth, off the island of Guam, being 31,614 ft. The volume of water in this space is estimated at 300,000,000 cubic m. Although the surface of the ocean waters is continuous, the islands rising above it divide it into three greater areas or basins—the Pacific, the Atlantic, and the Indian. Ocean waters are normally bluish in color, brackish in taste, heavier than pure water, and less easily heated and cooled. The color of sea water varies greatly. In addition to the hydrogen and oxygen of water and the oxygen and nitrogen of air contained in the ocean, some thirty other chemical elements are found, the majority in minute quantities. The soluble salts, however, make up some 35 parts in every 1,000. Chlorides predominate in sea water, carbonates in river water. It is not enough, then, to assume that the constant evaporation of pure water, and the constant addition of river water with salts in solution, explain the salinity of the ocean.

Only 16 per cent. of the surface waters, but as much as 92 per cent. of the bottom waters, have a mean temperature under  $40^{\circ}$  F. Murray calculates that over 80 per cent. of the water has a temperature under, and less than 20 per cent. has a temperature over,  $40^{\circ}$  F. Enclosed seas in warm regions receiving little rain or river water have even higher salinities than the trade-wind areas; while such as receive many rivers, even if the rainfall is low, have much lower salinities.

Density is the chief factor determining movement of water in parts of the ocean beyond the influence of factors acting on its surface. The surface currents are undoubtedly caused by the prevailing winds, and they move, like the winds, round the areas of high pressure, clockwise in the Northern, counter-

clockwise in the Southern Hemisphere. (See OCEAN CURRENTS.)

The *ocean floor* is covered with deposits, which are derived from the more permanent remains of dead organisms which have sunk, mixed near the land with terraqueous deposits. (See DEPOSITION.)

**Ocean Currents** are portions of the ocean bodies which, despite the temporary effects of wind and tide, proceed on the whole in a definite direction. They may be divided into *streams*, deep, narrow, and swift of motion, and *drifts*, broad, shallow, and slow. Currents are usually classified according to their causes as Horizontal and Vertical.

Horizontal Currents are believed to be the effect of the permanent winds (see WINDS). These winds, by communication motion through friction to the surface below them, commence a general set of currents. Vertical Currents are probably caused by variations in density, controlled by the factors of heat and salinity. Ocean currents are also largely influenced by the configuration of the land, diverting them from their normal courses; the diurnal rotation of the earth, producing a deflection toward the right; and the gravitational bodies, particularly the moon and sun.

The effects of ocean currents are primarily climatic—the warm currents from equatorial regions moderating the temperature farther north, and the polar currents having the opposite effect, notably in the region of Labrador. The juxtaposition of warm and cold currents, as off the Newfoundland Banks, often causes fog.

The principal ocean currents of the earth pursue the general cyclonic course observed in the North Atlantic. Here the North Equatorial Current, flowing westward with the trade winds, is turned northward by the shore of America, and enters the Gulf of Mexico. It emerges as the Gulf Stream, the greatest and most important of all the ocean currents, which flows northward along the eastern coast of the United States to Newfoundland. The Gulf Stream is then turned diagonally eastward by the prevailing westerlies, and crosses the Atlantic Ocean to the Azores, where one branch turns n. to flow past Norway and Iceland, and the other s. to complete its revolution by rejoining the Equatorial Current.

In the South Atlantic is the South Equatorial Current, separated from the North Equatorial Current by a compensating current flowing eastward. Turning southward, the main stream becomes the Brazilian Current, and flows along the coast of South Ameri-

ca until diverted toward the e. by the westerly winds. The portion flowing northward as a cold current along the west coast of Africa is called the Benguela Current.

The Pacific Ocean presents the same phenomena of equatorial and compensating currents, the latter being particularly noticeable when reinforced by the southwest monsoons. In the Northern Hemisphere this flows along the coast of Japan and eastward across the Pacific as the Kuro Siwo; in the Southern Hemisphere it washes Eastern Australia as the Australian Current and Africa as the Agulhas Current. The currents in the Indian Ocean vary with the season, according as the North or South Equatorial Current prevails. See GULF STREAM; ATLANTIC OCEAN; PACIFIC OCEAN.

**Oceania**, the name given to a fifth division of the globe, embracing the islands of the Pacific Ocean or South Sea. Excluding Australia and New Zealand, the total land area is some 70,000 sq. m., scattered over a vast extent of ocean—for 30° on either side of the Equator—from the Hawaiian or Sandwich Islands on the n. to the Cook or Hervey Islands and Pitcairn Islands on the s. Many of the islands are of volcanic origin, but the great majority are coral atolls. The total population is about 1,000,000. See AUSTRALASIA; MELANESIA; MICRONESIA; POLYNESIA; FIJI.

**Oceanography.** See **Ocean**.

**Oceanus** was, according to Homer, the beginning of all things. He was the original father, as his wife Tethys is the original mother. Oceanus was also in Greek mythology the great river which bounded the earth and sea, itself unbounded, and surrounding the habitable lands, regarded as flat.

**Ocelot**, a wild cat of America, ranging from Louisiana to Patagonia.

**Ochres (Ochers)** are native pigments consisting of clays or earths composed chiefly of silica and alumina, along with oxide of iron or more rarely with other oxides.

**Ochs, Adolph Simon** (1858-1935), Publisher of the New York Times. Born in Cincinnati, O., he spent his boyhood in Knoxville, Tenn., and there embarked on what was to be one of the most successful careers in American journalism. He was newsboy, printer's apprentice and printer in Knoxville before moving to Chattanooga, where he progressed through all the stages to become owner of the Chattanooga Times in 1878. It was in 1896 that he acquired the New York Times, a sickly newspaper property which under his direction became one of the world's

outstanding newspapers. In 1901 he purchased the Philadelphia Times, consolidated it with the Philadelphia Public Ledger, and in 1912 sold the merged property to Cyrus H. K. Curtis (q.v.). From 1900 until his death he was a member and director of the Associated Press.

**Ocmulgee River**, rises in Newton co., Georgia. After a course of about 280 m. it joins the Oconee River in Montgomery co. to form the Altamaha.

**Oconee River**, rises in the northeastern part of Georgia, and follows a southerly course for about 270 m. to its junction with the Ocmulgee to form the Altamaha.

**O'Connell, Daniel**, 'the Liberator' (1775-1847), Irish patriot and orator, was born near Cahirciveen, County Kerry. He became famous as a counsel, as well as an unrivalled cross examiner of Irish witnesses. On the death of Henry Grattan in 1820, O'Connell flung himself into the agitation for Catholic emancipation; and in 1830 he took his seat as a member of Parliament for Clare. In 1833 he was forced against his better judgment to bring the Repeal movement prematurely into Parliament. The debate lasted nine nights, and the motion was defeated by 523 to 38.

In 1834 O'Connell brought up the question of Repeal in the Dublin corporation in a splendid oration of four hours' length, and carried it against Isaac Butt by 41 to 15. The agitation now leaped into prominence; Conciliation Hall was built in Dublin; and a country-wide organization was perfected. During 1843 O'Connell travelled 5,000 m.; and monster meetings were held in every corner of Ireland. The meetings were proclaimed; and early in 1844 O'Connell was tried with his son and five of his chief supporters for a conspiracy to raise sedition; was found guilty. But the House of Lords set aside the verdict as erroneous, and bonfires blazed across Ireland from sea to sea. He now fell back on federalism ('Home Rule'); and soon came an open split between him and 'Young Ireland,' the members of which seceded, after angry disputes, in 1846. O'Connell left Ireland for the last time on Jan. 26, 1847, and travelled to Hastings, Folkestone, Boulogne, Paris, Lyons, Marseilles, and Genoa, where he died.

**O'Connell, William Henry, Cardinal** (1859-1944), Am. Roman Catholic prelate, was born in Lowell, Mass. In 1901 he became bishop of Portland, Me., and in 1905 was sent as the personal ambassador of Pope Pius x. on a mission to the Emperor of Japan. In 1906 he was made archbishop of Constance;

in 1908, archbishop of Boston; and in November, 1911, was created cardinal.

**O'Connor, James Francis Thaddeus** (1885- ), lawyer. He was fusion candidate for governor in North Dakota in 1920 and for the U. S. Senate in 1922. In 1933 he was appointed comptroller of the currency of the United States.



*Daniel O'Connell.*

**O'Connor, Thomas Power** (1848-1929), Irish political leader and journalist, born in Athlone. Starting in journalism on the staff of the London *Daily Telegraph*, and later of the New York *Herald* (London office) he founded and edited *The Star*, *The Sun*, *The Weekly Sun*, *M. A. P.*, *T. P.'s Weekly*, and *T. P.'s Magazine*. In 1883 he was elected president of the Irish Nationalist League, and was re-elected for many terms. His works include *Lord Beaconsfield* (1879); *In the Days of My Youth* (1900).

**Oconomowoc**, city, Waukesha co., Wisconsin, on the Oconomowoc River and on the Chicago, Milwaukee, and St. Paul Railroad; 35 m. n.w. of Milwaukee. It is a residential place and summer resort. Agriculture and dairying, iron working and brewing are the chief industries. The city is the seat of the Nashotah Mission (1842), and of St. John's Military Academy; p. 4562.

**O'Conor, Charles** (1804-84), American lawyer, was born in New York City, of Irish parents. He was engaged in many of the important cases of his time in New York. He was actively interested in the Irish Nationalist movement. In 1872 was nominated as candidate for President by a convention of Demo-

crats dissatisfied with the nomination of Greeley. He was prominent in the prosecution of the members of the Tweed Ring (1871-5).

**Octagon**, a polygon having eight sides. In a *regular octagon* the sides and the angles are equal, each interior angle being  $135^\circ$ , and each exterior angle  $45^\circ$ .

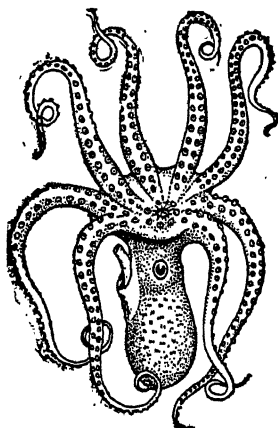
**Octans**, a small constellation formed by Lacaille in 1752. The south pole of the heavens is situated near  $\sigma$  Octantis, a star of 5.8 magnitude.

**Octave**, in music, an interval—the most perfect consonance in music—which is produced when the higher of two sounds contains double the number of vibrations of the lower sound. The eighth note of a diatonic scale is always the octave of the first note. The term octave is also applied to the series of notes forming a scale—as an octave of the scale of C.

**Octavia**, the sister of Augustus, the Roman emperor, noted for her beauty and virtue. She was married to the triumvir Mark Antony, in 40 B.C. Antony's abandonment of her for Cleopatra led to the war between him and Augustus. Octavia died in 11 B.C.

**Octavia**, the daughter of the Emperor Claudius and Messalina. She was married to Nero, who first divorced her on the plea of sterility, and then (62 A.D.) when she was only 20, had her put to death on the charge of adultery.

**October**, the eighth month of the old Roman year, and the tenth in the Julian calendar. It has thirty-one days.



*Common Octopus*

**Octopus**, a genus of molluscs belonging to the family Octopodidae. To this genus belong

an enormous number of species, of which one, *O. vulgaris*, is numerous on the southern coasts of Europe. A similar species (*O. americanus*) is the 'devil fish' of the Florida reefs; and tropical shores abound with them. They are characterized by eight tapering arms with 2 rows of suckers along the inner side of each, and a pear-shaped body.

**Octroi**, a term applied to a tax levied on articles passing into a town. The money received goes in part to the national treasury and in part to the town itself.

**Odd Fellows, Grand United Order of**, a branch of an English order of that name, organized in the United States, in 1843, for and by negroes. It has no connection with the Independent Order of Odd Fellows.

**Odd Fellows, Independent Order of**, a benevolent and fraternal order, dating in England from the 18th century and established in the United States in 1819, with the organization of Washington Lodge in Baltimore. The order in 1843 severed all connection with the 'Manchester Unity,' an organization formed in 1814 after internal dissensions, and the Grand Lodge of the Independent Order of Odd Fellows of the United States was formed, which in 1879 took the title of Sovereign Grand Lodge of the Order. Subordinate lodges confer three degrees, the attainment of the highest of which makes the holder eligible to membership in an 'encampment.' The latter confers the English Patriarchal and the American Golden Rule and Royal Purple degrees. In 1884 a military degree, the Patriarchs Militant, was established, open to holders of the Royal Purple degree. The Rebekah degree for women was organized in 1851. Quasi independent grand lodges exist in Australia, Germany, Sweden, Denmark, the Netherlands, and Switzerland. Each state, territory, and province in North America has its grand lodge.

**Ode**, a Greek term for a lyric or melic poem sung to a musical accompaniment. Two main forms of ode emerge in Greek poetry. The first consists of a series of uniform stanzas constructed on a somewhat elaborate metrical system. This was used for the personal lyric of Sappho, and may be called the Æolic, or, from its adoption for the imitative Roman lyric, the Horatian ode. The other is the Dorian or choric ode, designed for singing by groups of voices, answering each other or in unison. In English poetry the Horatian ode exists in every degree of elaboration, from the simple stanzas of Shelley's *To a Skylark*, to Swinburne's *Ave Atque Vale*. The choric ode, in its strict form, is used in such modern imitations of classical

tragedy as Matthew Arnold's *Merope*. More frequent, however, is a third type, the so-called 'irregular ode,' as Wordsworth's *Intimations of Immortality*.

**Odell, Benjamin Barker, Jr.** (1854-1926), American public official, was born in Newburgh, N. Y. He became the recognized Republican leader of Orange co., was a member of Congress in 1895-1901, and governor of New York for two terms (1901-05).

**Odense**, town, Denmark, capital and largest city of Funen, and see of a bishop. Of interest is the cathedral of St. Knud, erected in the 11th century. The leading industries are breweries, glassworks, textile mills and the export of butter, cheese, hides, bacon, corn, and molasses. It is the birthplace of Hans Andersen; p. 52,376.

**Odenwald**, mountainous district in southern Germany, lying e. of the Rhine. The highest peak is Katzenbuckel (2,057 ft).

**Oder**, (Lat. *Viadrus*), river of Germany, rising in the Sudetic Mountains in Moravia, and after a course of 563 m. falling at Stettin into the Pommersches Haff, which is connected with the Baltic by three arms.

**Odessa**, city, Ukrainian U. S. S. R., its most important port, on the Black Sea. The streets and squares are broad, well paved and kept, and shaded by trees, there are several beautiful parks and some of the main streets and boulevards are very fine. The university was inaugurated in 1865. The trade of Odessa is large and flourishing. The chief exports are cereals, caviar, and wood; p. 604,000.

**Odin, Woden, or Wuotan**, the supreme god of the Teutonic tribes, the bestower of wisdom and valor. Under the influence of Roman ideas he became identified with Mercury, and thus the Dies Mercurii was Teutonized into 'Woden's Day' (Wednesday).

**Odontology**, that branch of scientific knowledge that has to do with the teeth.

**Odysseus, (Latin, Ulysses)**, a legendary Greek hero, one of the chief leaders in the Trojan War. When the Greek fleet assembled at Aulis, Odysseus joined it with 12 ships and during the siege of Troy proved himself a valiant and wise warrior and an eloquent negotiator. After the fall of Troy he wandered about for ten years meeting with many adventures. These adventures form the theme of Homer's great epic the *Odyssey*. Upon his return to his home Odysseus made himself known to his son Telemachus, slew the insolent suitors of his wife Penelope, and spent a happy old age.

**Œdipus**, in ancient Greek legend, a king of

Thebes in Boeotia, the son of Laius and Jocasta, and father of Eteocles, Polynices, Antigone, and Ismene. When Œdipus was born, Laius had him exposed on Mt. Cithæron. A shepherd found him, and took him to Polybus, king of Corinth, who adopted him as his own son. Œdipus met Laius and slew him. Œdipus later learned from the prophet Tiresias that he had killed his father and also that he had married his own mother; whereon he blinded himself and Jocasta took her own life. The story is best told in Sophocles' *Œdipus Rex*.

**Cenone**, in ancient Greek legend the wife of Paris, the son of Priam, king of Troy, before he deserted her for Helen. Her story is told in Tennyson's *Cenone*.

**Cenothera**, or **Evening Primrose**, a genus of flowering shrubs belonging to the order Onagraceæ. There are nearly 100 species, mostly native to North America. The fragrant, showy flowers, yellow, white, or rose in color, have four petals obovate in form, and eight stamens.

**Ersted, Hans Christian** (1777-1851), Danish physicist, discoverer of electro-magnetism, was born on the island of Langeland. He became professor of physics in the University of Copenhagen in 1806. His great discovery was dealt with in *Experimentia circa Effectum Conflictus Electrici in Acum Magneticam* (1820).

**Oesel**, an island in the Baltic Sea at the entrance to the Gulf of Riga, formerly belonging to Russia, later a part of Esthonia. The chief industries are agriculture, fishing, and cattle raising; p. about 65,000.

**Œsophagus**, or **Gullet**, is the muscular tube through which food travels from the pharynx to the stomach.

**Offenbach, Jacques** (1819-80), French composer, was born of Jewish parents, in Cologne. He settled in Paris (1833), became conductor of the Théâtre Français orchestra (1848), and in 1855 took over the Théâtre Comique, which he renamed Bouffes Parisiens. Here he produced over seventy popular operettas. Among the best known of his compositions in *Les Contes d'Hoffmann* (1881).

**Offertory**. The alms which are collected at divine service are very commonly called the offertory, but the term is rightly applicable to the solemn offering up of these alms and the oblation of the bread and wine in the eucharist; also to the anthem or verses sung while the alms are being gathered.

**Officer, Army**, one who holds a commission. Officers rank from lieutenant general

down to second lieutenant. Divided by rank there are general officers, brigadier, major, and lieutenant generals; field officers, majors, lieutenant colonels and colonels; and line officers, second and first lieutenants and captains. Divided as to duties there are staff officers and regimental officers, the former belonging to the general staff and including the quartermaster general, adjutant general, aide-de-camp, and others. The majority of the line officers are furnished from the graduates of the U. S. Military Academy at West Point.

**Og**, Amoritical king of Bashan, is represented as the last of the giant race of the Rephaim.

**Ogden**, city, Utah, county seat of Weber co., at the Junction of the Ogden and Weber Rivers. About two m. from the city is Ogden Canyon, a mountain resort. Ogden has grown to be the industrial centre of the inter-mountain region; p. 43,688.

**Ogden, Robert Curtis** (1836-1913), American merchant, accepted a partnership with John Wanamaker in Philadelphia, and in 1896 undertook the development and management, for the firm, of its New York establishment. He was also president of the board of trustees of Hampton Institute and president of the board of directors of Union Theological Seminary.

**Ogden, Rollo** (1856-1937), American editor, was born in Sand Lake, N. Y. In 1883 he entered the journalistic field, and in 1891 joined the staff of the New York *Evening Post*, becoming editor upon the retirement of Horace White in 1903. In 1920 he became associate editor of the New York *Times*, and in 1922 was made editor-in-chief. He has written a biography of William H. Prescott (1904), and edited *Life and Letters of Edwin L. Godkin* (1907).

**Ogdensburg**, city and port of entry, New York, St. Lawrence co., on the St. Lawrence River. It is at the foot of deep-water navigation of the Great Lakes and the St. Lawrence River. Ogdensburg is a manufacturing and commercial centre, with a lake port important in grain trade. The leading manufactures are lumber, silk, paper, flour, gloves, leather, and brass goods; p. 16,346.

**Oglala Indians**, a large subdivision of the Teton of the Dakota. At present they live upon Pine Ridge Reservation, S. D. See Sioux.

**Oglesby, Richard James** (1824-99), American soldier and legislator, was born in Oldham co., Ky. At the opening of the Civil War he was appointed colonel of the Eighth Illinois Infantry, and was made brigadier-general and major-general of volunteers in 1862. He was

governor of Illinois in 1865-69, and was again elected in 1872, but in the same year was elected U. S. Senator, in which office he served until 1879. He was a third time governor in 1885-89.

**Oglethorpe, James Edward** (1696-1785), English soldier and colonist, was born in London. In 1722 he entered Parliament, where he interested himself in the conditions of the debtors' prisons. In 1729 he made several reports on the subject, and the interest thus awakened resulted in the founding of the colony of Georgia as a refuge for those oppressed by debt. A royal charter was secured, and Oglethorpe as governor took out the first lot of settlers and founded Savannah (1733). He secured the friendship of the Indian tribes, and successfully defended the colony against the Spaniards.

**Oglethorpe University**, a co-educational institution for higher learning founded in Atlanta, Ga., in 1913.

**O'Gorman, James Aloysius** (1860-1943), American jurist and legislator, served as judge in the district court from 1893 to 1900, when he was elected to the supreme court of New York for a term of fourteen years. While he was supreme court judge he became grand sashem of the Columbian Order of Society of Tammany. In March, 1911, he was elected U. S. Senator from New York State. He resumed the practice of law upon his retirement from office, and in 1934 was appointed official referee for the New York State Supreme Court.

**O'Gorman, Thomas** (1843-1921), American Roman Catholic bishop, was born in Boston. He was consecrated bishop of Sioux Falls, S. D., in 1896. He wrote a *History of the Roman Catholic Church in the United States*.

**Ogpu, or O. G. P. U.**, secret service department of the U. S. S. R. organized 1922 to prevent counter revolutionary plots.

**O'Higgins, Bernardo** (1778-1842), dictator of Chile, succeeded in expelling the Spanish troops from the country. He is regarded as the liberator of Chile, and a statue to his memory stands in the city of Santiago.

**Ohio** (popularly called the 'Buckeye State'), one of the North Central group of the United States. It is bounded on the n. by Michigan and Lake Erie; on the e. by Pennsylvania and West Virginia; on the s. by West Virginia and Kentucky; and on the w. by Indiana. The Ohio River separates it from West Virginia and Kentucky.

The State is crossed by a low-lying ridge from n.e. to s.w., which reaches its greatest

height (1,540 ft.) at Bellefontaine. From this the slope is toward Lake Erie on the n., and the Ohio River on the s. The surface is generally level or rolling, being somewhat more rough in the s.e. In the west-central part is a considerable stretch of prairie country. The chief streams of the northern slope are the Maumee, Sandusky, Vermilion, Black, Rocky, Cuyahoga, Grand, and Ashtabula, all emptying into Lake Erie. The St. Joseph River flows southwestward across the northwest corner of the State. The chief tributaries of the Ohio are the Little Beaver, Muskingum, Mahoning, Hocking, Scioto, Little Miami, and Great Miami.

The climate is continental. The soil of the northern three-fifths of the State is almost everywhere rich and tillable. No rocks older than the Palaeozoic era come to the surface in Ohio. The oldest formations are comprised in the limestones of the Lower Silurian epoch, found in the southwestern part of the State. Rocks of the Devonian system predominate in the w., n.w., and n.e. Ohio ranks high among the States in the value of mineral products: with sandstone produced, and grindstones, pulpstones, oilstones and lime; especially valuable are limestone, pig iron, mineral paints, the quantity of coke; the quantity of salt and raw clay; the output of coal, and petroleum and natural gas.

*Industries and Agriculture.*—Corn, wheat, and hay are grown generally throughout the State, though the soil of the n.e. is best adapted to wheat, and that of the Ohio Valley to corn. Tobacco is grown chiefly in the western and southwestern parts. Corn constitutes more than one-half the acreage of all cereals. Apples are the largest fruit crop. Strawberries are by far the most important of the small fruits grown in Ohio. There is considerable stock raising. Ohio is largely a manufacturing State. Its early industrial development was due in part to its excellent location, since its manufactures received an impetus from the rapid settlement of the Mississippi Valley, which opened a market for manufactured products in which the Eastern States were unable to compete with success. Furthermore, the splendid advantages afforded for transportation by water as well as by rail cannot be overestimated. Lake Erie and the Erie Canal make a direct outlet to the Atlantic seaboard; the western Great Lakes and the Sault Ste. Marie Canal furnish a water route to the Northwest States; while the Ohio River and its tributary, the Muskingum, offer communication with Pennsylvania and the States



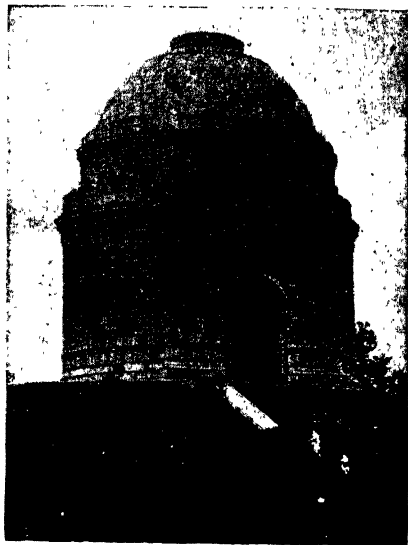
of the Mississippi Valley. The manufacture of iron and steel and their products constitutes the most important industry in Ohio and entitles the State to a place only below Pennsylvania in this respect. In the total value of finished products of iron and steel, the output of foundries and machine shops is the most important. In practically every city of any importance there are many concerns of this kind. Ranking next in importance is the manufacture of rubber, one of the most highly concentrated industries in the country, especially at Akron. Ohio ranks next to Michigan both in the manufacture of automobiles and in the manufacture of automobile bodies and parts. Slaughtering and meat packing is the most important branch of food manufacture; a large part being done in Cleveland and Cincinnati. The making of chemicals and acids and allied products—soap, coke, salt, paints and varnishes—and petroleum refining has an annual value only slightly below that for automobiles, Ohio ranking high in all these industries. East Liverpool has one of the world's most extensive pottery works. The manufacture of electrical machinery, centers in Cleveland, Toledo and Dayton. The principal towns of Ohio have fine airports. Notable is the hangar at Akron. Cleveland, Toledo and Sandusky are important ports.

*Population.*—According to the Federal Census for 1940 the population of Ohio was 6,907,612. Of this total foreign-born whites numbered 644,151. Ohio has a State board of Education, but it does not have full control over many of the school activities. It does have the management of the Smith-Hughes vocational education. A State director of education disposes of the State aid for weak school districts and is the leader of the educational thought of the State. He is a member *ex officio*, of the board of trustees of each of the State normal schools and of the Ohio State University. Private institutions of higher education include Oberlin College, at Oberlin; Western Reserve University, at Cleveland; University of Cincinnati, Ohio Wesleyan University, at Delaware; Hiram College, at Hiram; Kenyon College, at Gambier; Marietta College, at Marietta; Antioch College, at Yellow Springs.

The legislature consists of a Senate and a House of Representatives both chosen biennially. Regular sessions convene in January of even years, and are not limited in length. Under the Reapportionment Act, Ohio has 23 Representatives in the National Congress. Columbus is the State capital.

The present State of Ohio was a part of that vast region w. of the Alleghanies originally claimed by France on account of the early French explorations about the Great Lakes. It also formed part of the grant made from ocean to ocean by English kings to various colonies along the Atlantic seaboard.

In 1749 the Ohio Company received for purposes of settlement a grant of 300,000 acres within the present limits of West Virginia and Ohio. This company was composed



*Photograph from Brown Bros.*

*McKinley Mausoleum, Canton, O.*

mainly of Virginia planters; and the efforts of Virginia to extend jurisdiction over the region beyond the Ohio River led to the French and Indian War. By the Treaty of Paris (1763), closing that war, the territory was ceded by France to England. During the war of Independence the entire Northwest Territory was won for the Americans by George R. Clark. By the Ordinance of 1787 the Northwest Territory was to be divided into not fewer than three nor more than five States.

Meanwhile a number of settlements had been made. A great impetus was given to settlement by the defeat of the Indians of the Northwest by Gen. Anthony Wayne. By an act of Congress of April 30, 1802, the territory was authorized to draft a constitution; and on Feb. 19, 1803, Ohio was declared a State. The capital, first located at Chillicothe in 1800, was removed to Zanesville in 1810, and has been located at Columbus since 1816.

The development of the State was greatly aided in 1825. In the northern part of the State, however, a strong anti-slavery sentiment early developed. Ohio was a loyal Union State, however, and furnished several of the most distinguished generals to the Union army. Among the latter were Grant, Sherman, McDowell, Rosecrans, and Garfield.

The financing of relief collapsed in many of Ohio's larger cities in Nov. and Dec., 1939. The cities demanded state aid but Gov. Bricker refused to call a special session of the legislature. The federal government enlarged its WPA rolls and eventually the cities borrowed sufficient temporary money to finance relief payments on a reduced basis for the balance of the year.

Seven Presidents of the United States have been natives of Ohio—Grant, Hayes, Garfield, Benjamin Harrison, McKinley, Taft, Harding.

**Ohio Company**, the name of a company organized for the purpose of establishing settlements in what was known as the 'Ohio Country,' part of which constitutes the present State of Ohio. It was organized in 1748, at the instance of the pioneer trader Thomas Cresap and included among its members, Thomas Lee then president of His Majesty's council in Virginia, Lawrence and Augustine Washington, half-brothers of George Washington, and later, Governor Dinwiddie.

**Ohio Company of Associates**, The, was organized at the Bunch of Grapes Tavern in Boston in 1786, for the settlement of the Ohio country. It was composed of Revolutionary officers, under the leadership of Gen. Rufus Putnam and Rev. Manasseh Cutler. The pioneer company of settlers, consisting of about fifty New England officers, mechanics, and laborers, entered the grant early in 1788, and founded the town of Marietta.

**Ohio River**, the chief eastern tributary of the Mississippi, second only to the Missouri in length, and contributing more water than any other to that great stream. The Ohio proper is formed by the junction of two large streams, the Allegheny and the Monongahela, uniting at Pittsburgh in Western Pennsylvania. The junction at Pittsburgh is at an elevation of 1,021 ft. above sea level; and from this point to its mouth the river falls a total of 424 ft. The river has many changes of course, with a general southwesterly direction. It serves as a boundary line, separating Ohio, Indiana, and Illinois on the n. from Kentucky on the s.

**Ohio State University**, an institution of learning for both sexes at Columbus, Ohio, founded in 1870 under the provisions of the

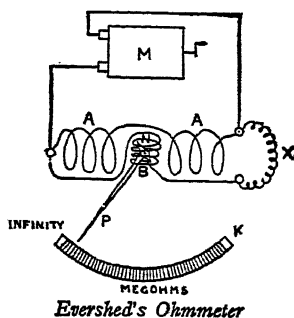
land grant act of 1862. The original endowment has been supplemented by permanent annual grants from the United States and from the State of Ohio.

**Ohio University**, an undenominational institution for both sexes at Athens, Ohio, chartered in 1804. The University has a College of Liberal Arts, Colleges of Education, Engineering, Agriculture, Industrial Arts, Household Economics, School of Commerce, School of Music, a Department of Oratory, and a nine weeks' summer session.

**Ohio Wesleyan University**, a co-educational institution in Delaware, Ohio, founded under the patronage of the Methodist Episcopal Church in 1841, and opened in 1844 as a college of liberal arts. In 1877 Ohio Wesleyan Female College was incorporated with the University. The University comprises a College of Liberal Arts, Schools of Music and Fine Arts.

**Ohm**, the practical electric unit of resistance. It is the resistance of a column of mercury, at 0° C., 106.3 centimetres long and 14.4521 grams mass. In practice the resistance of a coil of wire of some alloy is used. A *microhm* is one millionth of an ohm; a *megohm*, one million ohms. See ELECTRICITY, CURRENT.

**Ohm, Georg Simon** (1787-1854), a German physicist, was born in Erlangen. In 1841 he was awarded the Copley Medal in recognition of his work on electric currents, and in 1849 became professor at Munich, occupying the chair of physics from 1852. He is celebrated for his discovery of the law in electricity known as 'Ohm's law.' Consult Mann's *Georg Simon Ohm*.



**Ohmmeter**, an instrument for measuring electrical resistances directly. It indicates the ratio of the potential difference at the ends of a conductor to the current passing through that

conductor. It thus gives the resistance in ohms, volts

for ——— ohms. In the illustration amperes

shown herewith, Evershed's ohmmeter, A A are two fixed coils; B is a third fixed coil with its axis at right angles to that of A A. Inside B is a small needle N, pivoted, and carrying a pointer P, whose farther end moves over a graduated arc K. One set of coils acts as a current coil of low resistance, the other as a pressure coil of high resistance measuring the E.M.F. If the coils A A were used alone, the needle would set with its axis parallel to that of A A. Similarly if B were used alone. But if both are used at the same time, then the axis of the needle takes up an intermediate position which depends upon the resultant of the effects produced by the magnetic fields due to the coils A A and the coil B. The strengths of these fields depend on the strengths of the currents passing through the respective coils, and in the pressure coil is proportional to the E.M.F.

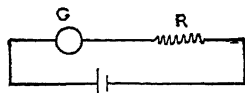


FIG. 2.

**Ohm's Law**, the most important law in electricity. Theoretically it defines resistance and conductance in terms of current strength and electro-motive force; practically it gives us a means of measuring electro-motive force in terms of current and resistance. Stated in its simplest form, the law is as follows: The strength of the current in a circuit varies di-

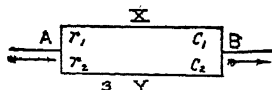


FIG. 3.

rectly as the electro-motive force and inversely as the resistance (or directly as the conductance) of the circuit.

**Oil and Gasoline Engines.** The gasoline engine is a form of internal-combustion engine in which the power is derived from the combustion of a mixture of gasoline vapor and air. The explosive charge is drawn into the cylinder through a mixing valve or carburetor in which the air and the gasoline vapor are mixed and is then compressed in the end of the

cylinder, after which it is ignited by an electric spark. The resulting combustion increases the pressure considerably and in expanding to a lower pressure the confined gases drive the piston outward and do work.

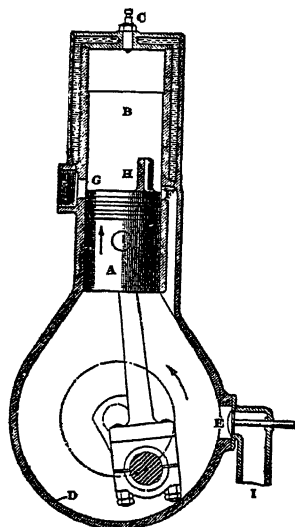


FIG. 1.—Two-Stroke-Cycle Gasoline Engine

**Two-Stroke-Cycle Gasoline Engine.**—The action of a two-stroke-cycle engine may be explained by aid of Fig. 1, which is a sectional view of such an engine. The piston A is near the bottom of the cylinder and has just started on its upward stroke. The space B above the piston is filled with an explosive mixture of air and gasoline vapor. As the piston rises, it compresses this mixture into a small volume at the upper end of the cylinder and thus increases the pressure to about 75 pounds per square inch.

At about the time the piston reaches the upper end of the stroke, an electric spark is formed between the terminals of the spark plug C, and the compressed charge of air and vapor burns. The combustion is so rapid that it is practically an explosion, resulting in an increase in the temperature and pressure of the gaseous products of combustion.

When the piston moves upward it tends to increase the volume of the air-tight crank case D and so forms a partial vacuum in it. As a result, the pressure of the outside atmosphere forces open the valve E, and air and gasoline vapor flow into the crank case from the carburetor or mixing valve (not shown). Thus,

on the upward stroke the piston draws a charge of explosive mixture into the crank case while it is compressing a charge in the cylinder. This upward stroke is, therefore, a combined suction and compression stroke.

After the explosion in the upper end of the cylinder, the pressure developed forces the piston downward on its working stroke, as the work done by the engine is received from the expanding gases on this stroke. Near the lower end of the working stroke the piston uncovers the exhaust port *G* in the side of the cylinder, and the gases, at a pressure of perhaps 35 or 40 pounds per square inch, escape through this port.

The descent of the piston at the beginning of the working stroke decreases the volume of the crank case and so increases the pressure of the mixture of air and gasoline vapor in it, thus forcing the valve *E* to its seat. Further downward movement of the piston compresses the mixture until it has a pressure of about 5 pounds per square inch. Near the end of the downward stroke, after the exhaust port is opened, the piston uncovers the port *F*, called the transfer port, which leads from the cylinder to the crank case. The mixture in the crank case then flows by way of the transfer port into

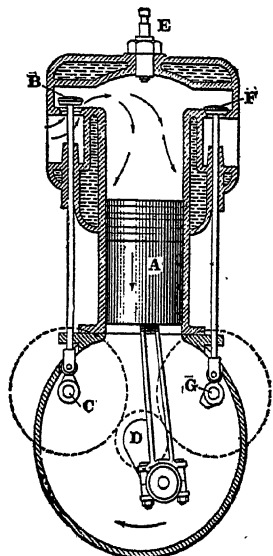


Fig. 2. Four-Stroke-Cycle Gasoline Engine.

the cylinder, striking the deflector *H* as it enters.

The deflector is used to prevent the incoming

charge of explosive mixture from passing out the exhaust port *G*, although a percentage, ranging from 10 to 30 per cent. does so escape. It deflects the fresh charge into the upper end of the cylinder and the entrance of this charge helps to drive out most of the burnt gases that remain. By the time the fresh charge has entered the cylinder the piston has started on its upward stroke, closing the ports *F* and *G*, and the series or cycle of operations just described is repeated. The vaporizer or carburetor for mixing the air and gasoline is attached to the pipe *I*.

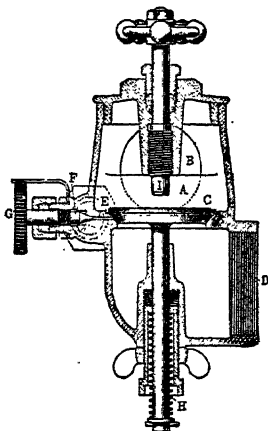


Fig. 3. Sectional View of Mixing Valve.

**Four-Stroke-Cycle Engine.**—In the four-stroke-cycle engine there is one working stroke in every four strokes, or two revolutions, made by the engine. A diagrammatic section of a four-stroke-cycle engine is shown in Fig. 2. The piston *A* is nearing the bottom of its suction stroke, and a charge of explosive mixture is being drawn in from the carburetor through the inlet valve *B*. This valve is opened by the action of a cam on the camshaft *C*, which is driven at half the speed of the crankshaft *D* by two-to-one gearing; that is, the gear on the camshaft has twice as many teeth as the gear on the crankshaft. Thus the inlet valve is opened once in every two revolutions of the crankshaft.

When the piston has reached the end of the suction stroke the valve *B* closes, and on the next upward stroke of the piston the gaseous mixture is compressed. This is known as the compression stroke. Just as it is completed a spark is produced by the spark plug *E* and the

charge is ignited. The resulting explosion drives the piston down on its third or working stroke. As the piston nears the bottom of the cylinder on the working stroke the exhaust valve *F* is opened by the cam on the camshaft *G*, which also is driven by two-to-one gearing from the crankshaft. The burnt gases then escape through the open exhaust valve.

The next upward stroke of the piston is called the exhaust stroke. While it is being made, the valve *F* is held open and the gases remaining in the cylinder are forced out through the exhaust valve, which closes when the piston reaches the upper end of the stroke.

*Mixing Valve.*—A simple form of mixing

The stop *I* can be set to give any desired lift of the valve *C*.

*Carburetor.*—Fig. 4 shows a section of a Schebler carburetor. The gasoline enters at *A* and flows into the bowl-shaped chamber *B* containing the float *C*. When the level reaches about the mid-height of the bowl, the float rises and closes the needle valve *D* and no more gasoline can enter until the level is lowered. Air enters at *E* and flows past the spring-loaded valve *F* into the passage *G* on its way to the engine, sweeping over the nozzle *H*. The suction exerted by the engine causes the gasoline to be drawn from the bowl *B* through the nozzle *H* past the regulating needle *I*, and the fuel is thus

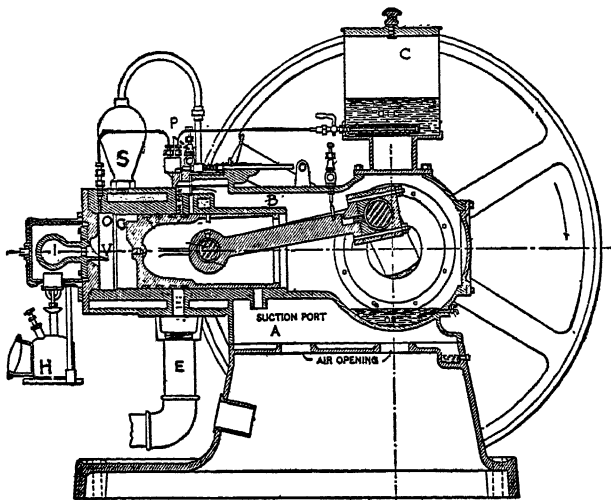


Fig. 5. Section of Meitz & Weiss Oil Engine.

valve of the type used on small stationary engines is shown in section in Fig. 3. The chamber *A* communicates with the inlet valve of the engine by way of the opening *B* and a suitable pipe. On the suction stroke of the engine a partial vacuum is formed in the chamber *A*, causing the valve *C* to rise and allowing air to flow in through the opening *D* past the valve.

In the seat of the valve is drilled a small passage *E* that may be opened or closed by a needle valve *F*. Gasoline from a storage tank flows by gravity into the passage *E*, the amount being regulated by turning the hand wheel *G* fastened to the needle valve. As the gasoline flows from the passage *E* it is caught up and sprayed by the passing air and carried on into the cylinder as a vapor mixed with the air. At the end of the suction stroke the valve *C* is returned to its seat by the action of the spring *H*.

sprayed into the air current and carried into the cylinder in a vaporized condition. In operation the float *C* assumes a position such that the gasoline entering through *A* just balances the amount passing out of the nozzle *H*.

*Types of Oil Engines.*—The oil engine differs from the gasoline engine in that it uses a fuel that cannot be vaporized by means of a carburetor or a mixing valve. Instead, the oil is sprayed into the compression space near the end of the compression stroke, and only air is compressed in the compression space during the compression stroke.

There are two distinct classes of oil engines. Surface Ignition, or Semi-Diesel, and Diesel.

*The Semi-Diesel Engine.*—The earliest engines using kerosene were provided with an external chamber kept heated by a torch or the hot exhaust. In this chamber the oil was in-

roduced and vaporized before being admitted to the engine cylinder. Such engines, at best, were inefficient, and as a solution Chas. Ackroyd Stuart, of England, developed an oil engine which later became known as the Hornsby-Ackroyd engine and which was the forerunner of all semi-Diesel or surface-ignition engines.

the differences between the Diesel and the gas engine are that in the Diesel nothing but pure air is compressed in the cylinder and the fuel is forced into the cylinder slowly, causing the combustion to be gradual; in the gas engine both the gaseous fuel and the air are compressed, and the combustion takes the form of an explosion.

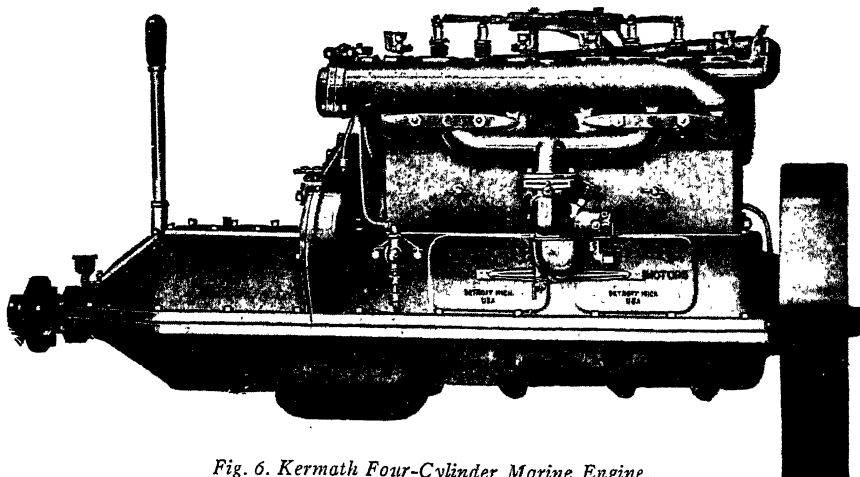


Fig. 6. Kermath Four-Cylinder Marine Engine.

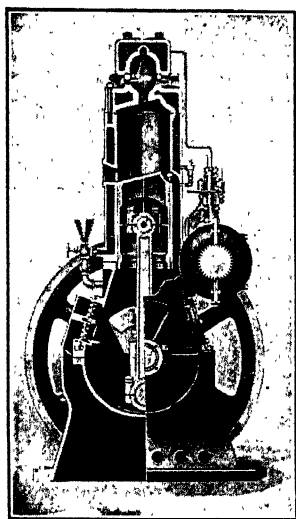


FIG. 6.—Anderson Two-Cycle, Medium-Compression Semi-Diesel Engine

*The Diesel Engine.*—The Diesel engine was patented by Dr. Rudolph Diesel, of Germany, in 1892. The first American Diesel was completed in 1898. From a practical point of view

The Diesel four-stroke-cycle consists of (1) a suction stroke during which a charge of pure air is drawn into the cylinder; (2) a compression stroke wherein this air is compressed by the piston to a maximum pressure; (3) a period of injection and combustion of a charge of fuel and the expansion of the gases, this being the working stroke of the piston, and (4) an exhaust stroke by means of which the burned gases are expelled from the cylinder.

*Diesel Locomotives.*—The high thermal efficiency of the oil engine makes the Diesel especially attractive for locomotive work. To obtain higher powers two or more engines are placed on a single locomotive. While gear drives such as used on automobiles have been tested, the most popular Diesel-locomotive drive is electrical. The engine drives a compound-wound direct-current generator having a separate exciter, and the current from the generator is supplied to the motor driving the wheels.

*Marine Engines.*—Gasoline and oil engines are extensively used to furnish the motive power for the propulsion of boats and ships being invariably of the vertical type when used for this class of service. The number of cylinders may vary from one to twelve, depending on the power required, and either the two- or

the four-stroke cycle may be effectively used.

The four-stroke-cycle marine gasoline engine closely resembles the automobile type of engine as may be seen from Fig. 6. The engine, flywheel and reversing gear (at the left) are carried by the base casting, producing a self-contained and compact unit. The propeller shaft is connected to the coupling at the left, the vertical lever being used to operate the reversing gear.

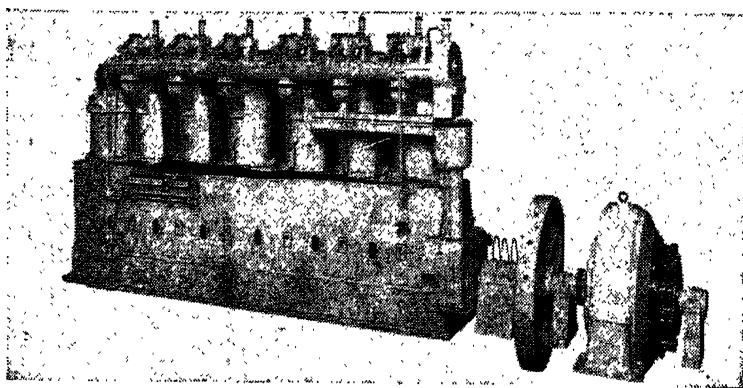
**Cooling Systems.**—A few engines use *air cooling*; that is, the outside of the cylinder is formed with a series of ribs or fins to increase the heat-radiating surface. Air is circulated over the cylinder and enough heat is carried

extensive use of Diesels in power plants, ships, dredges, excavators, hoists, heavy-duty trucks, buses and locomotives.

In 1935 C. L. Cummins, president of the Cummins Engine Company, placed a Diesel in his Auburn automobile and traveled 3,774 miles. This showed the adaptability of Diesels for automobiles.

In 1935 the Santa Fe Railroad acquired a Diesel weighing 20 pounds per horsepower, an engine which is much lighter than those usually built for streamline locomotives.

Diesel trucks are in use on the Pacific Coast for carrying freight between cities, with results superior to those of the gasoline driven



*Diesel Engine.*

off to keep the working parts at a sufficiently low temperature. For large engines, however, air cooling cannot be used successfully.

By far the most common method of cooling is *water-jacketing* the cylinder. The water may be run through the jackets by gravity or it may be forced through by the action of a circulating pump, the latter being the common practice on marine engines and stationary types above 10 horse-power.

From 1935 to 1937, important major developments in the construction of internal combustion motors appeared. Confronted by a demand for maximum efficiency under severe abuse, engineers are building motors with higher compression, composed of the most durable of metals. Improvement and perfection are most marked in the airplane motor.

Of late the engine which has proved itself remarkably efficient, economical, and compact is the Diesel. Better designing, materials, and construction are leading toward decreased weight per horsepower and a more

vehicles. A 14-passenger bus and trailer equipped with a Diesel engine and an air-conditioning unit operates between Damascus and Bagdad, a route covering 600 miles of the Syrian desert.

See GAS ENGINES; MOTOR BOATS; MOTOR CARS; MOTORCYCLES.

**Oil Cake**, the mass of compressed material remaining after the extraction of oil from various oil-bearing seeds by high pressure. It is rich in protein, fats, and carbohydrates, and is extensively used as a feeding stuff for farm animals, chiefly in connection with grain and coarse fodder. The principal kinds are linseed cake, cotton seed cake, peanut cake, palm-nut cake, sesame cake, and cocoanut cake.

**Oil City**, city, Pennsylvania, Venango co. The city is situated in a rich oil region, is a great oil market, and has petroleum refineries, foundries and machine shops, barrel works, wagon works, and manufactures of oil-well supplies; p. 20,379.

**Oilcloth**, a floor covering, consisting of burlap, or cotton, to which successive coatings

of oil paint have been applied, and usually having a colored design printed on one side.

**Oil Painting**, a process of painting in which oil is used as a vehicle for the pigments, the oils most commonly employed being linseed, poppy, and walnut oil, all of which have the property of drying rapidly. The discovery of the art has been generally assigned to John Van Eyck, who was born about 1390, and his elder brother Hubert, but it is probable that oils were in prior use for painting and that their method was merely a modification of an earlier one. See PAINTING; PIGMENTS; VARNISH.

**Oil Palm**, any one of a group of palms, closely allied to the cocoanut palms, whose fruit yields oil. The trees average from thirty to sixty feet in height and begin to bear in the fourth year. The fruit is orange or crimson in color, and occurs in cone-shaped clusters of 150 to 200 at the top of the stem. The matured seeds yield a pale yellow oil used in the manufacture of soap, candles, and lubricants, and as a substitute for butter. See PALM OIL.

**Oils**, a term applied to a large number of neutral liquids of vegetable, animal, and mineral origin, all of which are insoluble in water, and are of a high degree of viscosity. They fall into three groups: (1) the Fixed or Fatty Oils and Fats, or Solid Oils; (2) the Mineral or Hydrocarbon Oils; (3) the Essential Oils. The essential oils, such as oil of wintergreen, cassia, and eucalyptus, occurring in many plants and possessing characteristic odors, are not oils in the strict sense of the word. For their discussion, see ESSENTIAL OILS and PERFUMERY.

1. The **FIXED OILS AND FATS** are of vegetable or animal origin. The manner in which they are formed in the living organism is unknown, but the carbohydrates undoubtedly form the raw material for their production, and the processes involved are of enzymatic nature (see ENZYME). These vegetable fats are the chief source of animal fat; they are taken in with the food, digested, assimilated in the blood, and again deposited in layers under the skin, in the abdominal cavity and other places, or they are secreted with the milk. Fats and fixed oils are mixtures of triglycerides or neutral glycerides of the fatty acids, the most prominent of these being stearic acid, palmitic acid, and oleic acid. The consistency of fats and oils depends almost entirely on the proportion in which they contain these three triglycerides. Solid fats consist chiefly of tristearin and tripalmitin, while

triolein is the prominent constituent of oils. The individual fats and oils contain small percentages of other glycerides or other compounds to which their particular flavor, odor, color, and other distinctions are due. The means by which fats and oils are extracted from animal or vegetable material are many. Tallow and lard are sometimes melted out 'dry.' Fats and oils of animal origin as well as palm oils are often boiled out with water or steam at ordinary or higher pressures. Tallow, for instance, is in America recovered by melting the raw material in large vertical cylinders, by means of steam at 135° C. (3 atmospheres pressure), by which process the pure melted fat collects on top of the water. Filter presses are employed for recovering oils or fats from vegetable materials on a large scale. Another method of obtaining fats and oils is extraction by means of volatile solvents, such as carbon disulphide, benzene, or carbon tetrachloride. This method is extensively used for seeds, bones, press cakes, etc., but it cannot be used for edible fats or oils.

The fatty oils are only slightly soluble in alcohol, with the exception of castor oil, which easily dissolves. They are readily soluble in ether, benzene, chloroform, carbon bisulphide, and, with the exception of castor oil, in petroleum spirit and oil. Some of the fatty oils, linseed oil in particular, when exposed to the air in thin films, absorb oxygen, and become hard. These oils are called drying oils, and are valuable for painting. Other oils, such as olive oil, do not dry, but at most become a little more viscid. These are called non-drying oils, and are extensively used for lubricating machinery. The following are the more important fatty oils of the three groups:—**Drying Oils**.—Linseed, hemp, walnut, poppy-seed, sun-flower, fir-seed, Chinese-wood, and menhaden oils. **Semi-drying Oils**.—Niger-seed, cameline, maize, kapok, cottonseed, sesame, rape, colza, mustard, croton, castor, grape-seed oils. **Non-drying Oils**.—Olive, ground-nut, apricot, almond, ben, sperm, cod-liver, whale, seal, porpoise, neat's-foot, laurel, palm, cocoanut, butter, lard, and tallow. One of the most important properties of all the fatty oils is that, when boiled with either caustic soda or potash, they undergo what is called saponification, glycerine is set free, and the alkali combines with the acids of the oil and forms a soap. Butter is used almost exclusively as a food, as are also the better grades of olive, cotton, groundnut, cocoanut, and sesame oils; while the lower grades are used for making soaps.



Lard is used as a food fat, and also in soap making. Sperm and colza oils are burned in lamps. Palm oil and tallow are largely used in making soaps and candles, while the finer grades of castor, almond, coconut, and cocoa-butter oils are used in medicine.

2. **HYDROCARBON OILS**, which have been known only about half a century, are derived from petroleum. These oils appear in commerce in a variety of forms: (1) As limpid, colorless liquids, very volatile and inflammable, generally known as naphthas, benzine, or benzoline, being largely used in paint and varnish making, oil and fat extraction, dry cleaning of garments, and as fuel for internal-combustion motors. (2) Waterwhite limpid liquids, not very volatile, used as burning oils in lamps. (3) Yellow-colored oils which are extensively used for lubricating machinery. (4) Viscous and in some cases buttery products, used for lubricating the cylinders of engines, for which purpose they are superior to any other oils. Vaseline, of value in pharmaceutical work, belongs to this type of oils.

The hydrocarbons of which they are composed can be divided into three groups—(1) paraffins, (2) olefins, and (3) naphthenes. The first series are most characteristic of the products derived by distillation from Scottish shale. The olefin series, which are not so well known, are similar to the paraffins, but are unsaturated; while the liquid members are somewhat more oily in appearance. They are found in fairly large quantities in American and other petroleum. The naphthenes, as a rule, are more viscous than either the paraffins or olefins, and are characteristic of Russian petroleum and of the oils which can be obtained from resin by distillation.

**Hydrogenation of Oils.**—It is possible to convert relatively cheap raw oils into valuable hard fats by the process of hydrogenation—by converting the oleic acid or olein, which forms the principal constituent of oils, into stearic acid or stearin by the addition of hydrogen.

In 1903 Norman disclosed the application of nickel catalyzers to the hydrogenation of fixed or fatty oils. It was proved by experiment that unsaturated compounds, bodies lacking hydrogen, could be saturated by contact with this gas in the presence of finely divided nickel; and various methods have been developed from this principle. The process is exceedingly valuable in the making of edible fat substitutes for lard and butter, in producing a tallow substitute for soap making; in making a stuffing for leather; and in the

manufacture of lubricants, candles, and insulation.

**Oil Shale**, a consolidated mud or clay deposit from which petroleum is obtained by distillation. It is black or brownish-black in color, with the exception of the weathered surfaces, which are white or gray, and is fine grained and tough, though friable in thin sections. When freshly broken, it may give off an odor like petroleum. Oil does not exist in oil shale as such, but is present in the form of a complex organic compound called kero-gen. Upon destructive distillation, that is, heating in the absence of air, this organic material is decomposed, yielding hydrocarbon oils and permanent gases. The shale contains also some nitrogenous material which is broken up into pyridine bases and ammonia.

The total output of shale amounts to about 3,500,000 tons annually. From this are produced burning oil, naphtha, lubricating oils, paraffin wax, and sulphate of ammonia. The United States' deposits of oil shale, to which attention has comparatively recently been drawn, are distributed widely over the country. The oil shales of Colorado underlie an area of some 2,500 sq. m., and it is estimated that in that State alone there is sufficient shale, in beds that are three feet or more thick and capable of yielding more oil than the average shale now mined in Scotland, to yield about 20,000,000,000 barrels of crude oil, from which 2,000,000,000 barrels of gasoline may be extracted by ordinary methods of refining, and in Utah there is probably an equal amount of shale just as rich. The same shale in Colorado, in addition to the oil, should produce with but little added cost about 300,000,000 tons of ammonium sulphate, a compound especially valuable as a fertilizer.

**Oilstones**, slabs of fine-grained, hard stone set in wooden blocks and used for sharpening tools, the surface being lubricated with oil.

**Oil Stoves**, greatly elaborated in recent years, nevertheless are practically lamps of suitable construction in which mineral oil is burned for heating and cooking purposes. Air is admitted so as to produce a smokeless and odorless flame of high heating power.

**Oil Wells.** See **Petroleum**.

**Ointments**, preparations formed of greasy substances, animal or vegetable fats, etc., with which are fused or incorporated various drugs for the purpose of external application.

**Oise**, department of Northern France, including parts of Picardy and Isle of France, and occupying both sides of the River Oise, n. of Paris. The surface is gently rolling, and

diversified with forests. The most important rivers are the Oise and the Aisne. The soil is fertile; p. 405,971.

**Oise-Aisne Offensive.** See **Aisne, Battles of.**

**Oise River**, a river of Northern France rises in the Belgian Ardennes, traverses the departments of Nord, Aisne, Oise, and Seine et Oise, and joins the Seine above Conflans. It was important in 1914. (See **MARNE, FIRST BATTLE OF THE.**)

**Ojibways**, or **Chippeways**, a branch of the Algonquin family of North American Indians formerly dominant along Lakes Huron and Superior and w. to North Dakota. They early allied themselves with the French; during the American Revolution and the War of 1812 they fought with the English; and in 1815 they helped to pacify the tribes of the Northwest. The land they occupied, between Lake Superior and the Mississippi, was gradually ceded to the United States after 1825, and they are now settled in Canada, and in Kansas, Minnesota, Wisconsin, Michigan, and North Dakota.

**O. K.**, an expression generally employed in the United States as equivalent to 'all right.' Its origin is variously given.

**Okapi**, (*Ocapia Johnstoni*), a mammal related to the giraffe, discovered by Sir Harry Johnston in the Semliki forest, protectorate of Uganda, East Africa, in about 1900. It differs from the giraffe in its smaller size, shorter limbs, short neck, and type of coloration.

**Okayama**, prefecture, Hondo, Japan, consists of the former provinces of Bizen, Bitchu, and Mimasaka. The capital is Okayama. The city is celebrated for its 16th-century castle.

**Okeechobee Lake**, in Southern Florida, the largest lake in the southern part of the United States. The Kissimmee River is its chief tributary. Part of its overflow is carried off by the Caloosahatchee River, and part spreads out over the Everglades.

**Okefinokee Swamp**, a large swamp of Southeastern Georgia and Northern Florida, some 700 sq. m. in area. The greater portion is marshy land infested with alligators.

**Okhotsk, Sea of**, branch of the North Pacific Ocean, to the e. of Siberia, separated from Bering Sea by the peninsula of Kamchatka, from the Pacific by the Kurile Islands, and from the Sea of Japan by the island of Sakhalin.

**Oki Islands**, off the west coast of Hondo, Japan. The capital is Saigo. Cuttlefish are exported; p. about 65,000.

**Oklahoma**, (a Choctaw Indian word, meaning 'red people'), a South Central State of the United States. It is bounded on the n. by Kansas and Colorado; on the e. by Missouri and Arkansas; on the s. by Texas; and on the w. by Texas and New Mexico. The Red River forms part of the southern boundary.

**Topography.**—In general, the surface of the State is a vast rolling plain, remarkably level along the northern border, and rougher toward the s.w. The country n. of the Arkansas and e. of the Neosho River is rough and deeply dissected by streams; that of the Canadian River is hilly and mountainous. The foothills of the Ozark Mountains enter Oklahoma on the e. The Chautauqua Mountains are in the central part; and the Wichita Mountains, in the southern part.

The drainage is toward the s.e., the chief streams being the Arkansas, Canadian, and Red Rivers.

**Climate and Soil.**—The climate is of the continental type. The western and central portions are cooler than the eastern. In the n. and w. the greater part of the soil is a rich humus.

**Mining.**—Oklahoma is important for the value of its output of petroleum. This industry is by far the most important in the State. The oil-producing area forms a part of the Mid-Continent Oil Field, extending also into Louisiana, Kansas and Texas. Oklahoma also ranks high in the production of zinc. This industry centers in Ottawa co., Bituminous coal fields cover an extensive area in the eastern part of Oklahoma. Native asphalt, fuel briquets, calcium chloride, cement, lime, mineral waters, sulphuric acid, salt, and diatomite are also important.

**Forestry.**—Oklahoma has Wichita National Forest, and woodland on farms, principally in the e. Oak, cedar, pine and black walnut are of commercial value.

**Agriculture.**—A noteworthy feature of agriculture in Oklahoma is the great diversity of crops, well illustrated by the extensive cultivation of corn, cotton and wheat. Among the cereal products, wheat exceeds all others, representing almost one-half of the total acreage and value. Peaches contributed more than half of the orchard crop. There is also much raising of farm animals.

**Manufactures.**—A marked increase in the independent industrial activities of the State began with the development of the oil fields in 1907 and the discovery of natural gas. The leading industries are petroleum refining; the milling of flour and grain; the manufacture

of cottonseed oil, cake and meal; the smelting and refining of zinc; printing and publishing; the making of foundry and machine-shop products; of butter; and bread and other bakery products.

*Population.*—According to the Federal Census of 1940 the population of Oklahoma was 2,336,434. In 1930, foreign-born whites numbered 26,753; Negroes, 172,198; Indians, 92,725; and Chinese, 206. The urban population in towns and cities of at least 2,500 inhabitants is 37.6 per cent. of the total.

*Education.*—Education is under the supervision of a State Superintendent of Public Instruction, and a State Board of Education consisting of the superintendent and six other members appointed by the governor. There are separate public schools for white and colored children. There are State teachers colleges at Ada, Tahlequah, Durant, Alva, Edmond, Langston and Weatherford. Publicly controlled institutions of higher learning include the University of Oklahoma at Norman; Oklahoma Agricultural and Mechanical College, at Stillwater; Oklahoma College for Women, at Chickasha; Panhandle Agricultural and Mechanical College, at Goodwell; Colored Agricultural and Normal University, at Langston. Under private control are the Phillips University, at Enid; Oklahoma City University, at Oklahoma City; the University of Tulsa, at Tulsa.

*Government.*—The present constitution of Oklahoma was adopted in 1907. The chief executive officers are the Governor, Lieutenant-Governor, Secretary of State, Treasurer, Auditor, Attorney-General, Superintendent of Public Instruction, and Commissioners of Labor, Insurance, Charities and Corrections, Banks, and Corporations, State Examiner and Inspector, President of the Board of Agriculture, and State Mine Inspector. The legislature consists of a Senate, with members elected for four years and a House of Representatives, with members elected for two years. Regular sessions are held in odd years. Under the Reapportionment Act, Oklahoma has 8 Representatives in the National Congress. Oklahoma City is the State Capital.

*History.*—The entire territory now included in Oklahoma, except that known for many years as the Public Land Strip, was included in the Louisiana Purchase of 1803. The Public Land Strip—now part of Beaver co.—was ceded by Texas to the United States in 1850, and added to Oklahoma in 1890. The country comprised in Oklahoma was early set aside

as the 'Indian country,' and was to remain unorganized.

Between 1825 and 1850 the Indian tribes of the Five Nations were granted large tracts of land in the Indian territory—the Cherokees the northern part, the Creeks and Seminoles the middle portion, and the Choctaws and Chickasaws the southern portion. In 1866 and 1889 the Cherokees, Creeks, and Seminoles transferred a large part of their possessions—comprising over 2,000,000 acres—to the Federal Government for an average price of 15 cents an acre.

White settlers were forbidden to locate on the ceded land. Notwithstanding this stipulation western speculators claimed that the lands were the property of the government, and open, like other public lands, for settlement under the homestead laws. Accordingly, in 1879 an organized effort was made to take forcible possession of the lands, and adventurers from Texas, Kansas, and Missouri, equipped and ready for permanent settlement, invaded the territory. Their action was forbidden by proclamation from President Hayes, and the intruders were finally ejected by United States troops. From this time until his death in 1884, David L. Payne, the leader of the 'boomers,' was repeatedly arrested, but he always evaded punishment and returned to the forbidden land, with the number of his followers augmented. In 1885 the President was authorized by Congress to open negotiations with the Creek and Seminole nations looking to the settlement of the vacant lands by white men. On April 22, 1889, the lands were thrown open to home-seekers. Thousands of prospective settlers collected along the border of the new lands, and at 12 o'clock, at a given signal, the race began for farms and town lots.

In 1890 Oklahoma Territory was set apart from Indian Territory. Agitation for statehood began in both territories in 1892, but in July, 1905, a joint statehood convention, attended by 1,000 delegates, met at Oklahoma City. At the following session of Congress, a Joint Statehood Bill was passed, providing for the admission of the two territories as one State, with the capital at Guthrie. On Sept. 17, 1907, the constitution was ratified by popular vote, and on Nov. 16 the State was admitted to the Union. The capital was removed to Oklahoma City in 1910.

**Oklahoma Agricultural and Mechanical College**, a co-educational State institution at Stillwater, Okla., founded in 1891, and including schools of agriculture, engineering,

home economics, science and literature, education, commerce and marketing.

**Oklahoma City**, capital and largest city of Oklahoma. The city is a distributing center for the oil industry of the entire Midcontinent oil area, and of a trade area extending through the western two-thirds of Oklahoma, and into Texas, Kansas and New Mexico. In 1928 the oil field came to the city's very door when Discovery Well became productive. A rich agricultural country surrounds the city. The city was founded in 1889, and its growth has been remarkable. It was made the State capital in 1910; p. 204,424.

**Oklahoma, University of**, a co-educational State institution at Norman, Okla., established in 1892. The School of Medicine, located at Oklahoma City, has a fine hospital there. The university is governed by a Board of Regents composed of seven members appointed by the governor.

**Okuma, Shigenobu, Count** (1838-1922), Japanese statesman, was born in Saga, province of Hizen, Kiushiu. In 1898 he succeeded Marquis Ito as Premier and Minister of Foreign Affairs, but soon retired. In 1914-15 he was again called to act as Premier and came into prominence by his declaration of war on Germany and his demands upon China in 1915. He founded Waseda University, Tokio, and the Japanese Women's University. He published *Fifty Years of New Japan* (1910).

**Olaf**, the name of several Norwegian kings. **Olaf II.** (995-1030), called the Saint, seized the Norwegian crown in 1016. His refusal to recognize the overlordship of Denmark involved him in a war with Canute the Great, and in 1030 he was killed. He was canonized in 1164, when he became the patron saint of Norway.

**Olcott, Chancellor John (Chauncey)** (1860-1932), American actor, appeared with Denman Thompson in *The Old Homestead* (1888-90), and then took part in *Pinafore* and *The Mikado* at the Academy of Music. He later took leading parts, both in the United States and in England, in Irish dramas.

**Old-Age Pensions**, regular allowances paid at stated periods to persons who have reached a certain age, as a recognition and in consideration of past services. In some cases a thrifty laborer may be able, during his youth, to provide for old age, but in most cases this is impossible. In recent years, therefore, a concerted movement has arisen among the chief industrial nations for the pensioning of the superannuated laborer. In the United States, the subject of old-age pensions has occupied an

ever increasing place in the public mind. In May, 1920, an act was passed by Congress which provided for the retirement of employees in the classified civil service. The system is contributory. The retiring age varies from 62 to 70. Several general old-age pensions have been introduced into the United States Congress, but up to 1935, no Federal action had been taken in the United States.

All of the systems established under State laws are straight pension plans, the entire cost being borne by the public through taxation. In Jan. 1935, there were 28 States which had old-age pension laws. Alaska passed the first successful old-age pension law in 1915. To be eligible for receipts of a pension, the applicant must have attained a certain age, varying from 60 to 70, and must fulfill certain requirements as to citizenship, residence, character and property. No maximum pension is set in New York or Massachusetts. In other States the maximum varies from \$250 a year in Kentucky to \$45 a month for women in Alaska.

By 1932 there were 39 countries, exclusive of the Soviet Union, where one or more systems of pensions or old-age insurance were established. These systems are of three main types: voluntary insurance under which the government sells annuities under favorable rates; compulsory insurance under which a general insurance fund is made up of contributions by two or all three of the parties concerned—the State, the employer and the employed; public pensions under which the cost is borne wholly by the public. In 1935 the United States enacted the Social Security Act, whereunder as amended 1939, monthly old age insurance benefits are payable after 1939, as conditioned in the act, to wage earners over the age of 65, in amounts based on their respective earnings from January 1, 1937. The plan is financed by payroll taxes on both employers and employees.

**Old Bailey**, a narrow street in the City of London, running from Newgate Street to Ludgate Hill. At the n.e. corner stood the ancient Newgate Prison.

**Oldcastle, Sir John, Lord Cobham** (d. 1417), English nobleman. He took part in the suppression of the Welsh revolt under Owen Glendower, and then assisted the Duke of Burgundy in the reign of Henry IV.

**Old Catholic Church**, also known as the **Evangelical Catholic Church**, formerly a part of the Roman Catholic Church, but since 1870 a separate body, independent of the Pope. The first steps toward separation from the

Roman Church were taken in Germany. Since then the Church has grown and spread in various countries. It is found in Germany, Switzerland, Austria, Croatia, Poland, Czechoslovakia and the United States.

**Oldenburg**, constituent part of Germany. In 1180 it was declared a countship of the empire; in 1777 made a duchy; in 1829 a grand duchy and in 1918 a republic; p. 545, 172.

The picture gallery of the capital, Oldenburg, contains a valuable collection of old masters. The manufactures include leather goods, glass, cigars, soap, machinery, and musical instruments; p. 52, 723.

**Old Glory**, a popular name for the United States flag.

**Old Guard**, a body of troops who, having accompanied Napoleon I. in his campaigns in Italy and Egypt, were organized into a consular and, later, an imperial bodyguard.

**Old Ironsides**. See **Constitution, The**.

**Old Red Sandstone**, a certain series of strata intermediate in age between the Silurian and Carboniferous systems. It consists of a series of red sandstones, gray and yellow sandstones and flagstones, with seams of red or gray shale and occasional beds of impure concretionary limestone developed characteristically in Scotland.

**Olean**, city, New York, Cattaraugus co., on the Allegheny River. Rock City, six miles distant, is a remarkable rock formation. The city is situated in a rich oil and natural-gas region and has important dairy interests; p. 21, 506.

**Oleander**, a genus (*Nerium*) of evergreen shrubs of the family Apocynaceæ, used for house decoration in the n. but growing out of doors in southern countries. They bear simple glossy leaves and terminal cymes of white or rose-colored flowers. They are propagated by cuttings from the leading shoots, which require warmth and moisture.

**Oleomargarine**, known also as **Margarine** and **Butterine**, an artificial substitute for butter, first manufactured in 1870, in France by its inventor Mege-Mouriès. It is made from oleo oil obtained from beef fat, neutral lard, and cottonseed oil, with a little butter, cream, or milk added during the churning.

**Olga**, St. (d. 969), wife of Grand Duke Igor of Kiev. About 955 she was baptized at Constantinople as Helena, and showed a missionary zeal among her own people which led to her canonization. July 21 (new style) being set apart for her in the calendar.

**Oligarchy**, a term signifying 'the government of the few.' It is first used by Herodotus

(c. 430 B.C.), who contrasts it with the government of a monarch and that of the people. Aristotle regarded aristocracy as differing from oligarchy in governing for the public good, while oligarchs aimed at their own advantage.

**Oligocene System**, strata formed during the epoch which elapsed between the close of the Eocene and the beginning of the Miocene. Certain formations along the Atlantic coast, such as the Ashley River marls of North and South Carolina, also the Vicksburg and Grand Gulf and Fayette formations of the Gulf region, belong to the Oligocene.

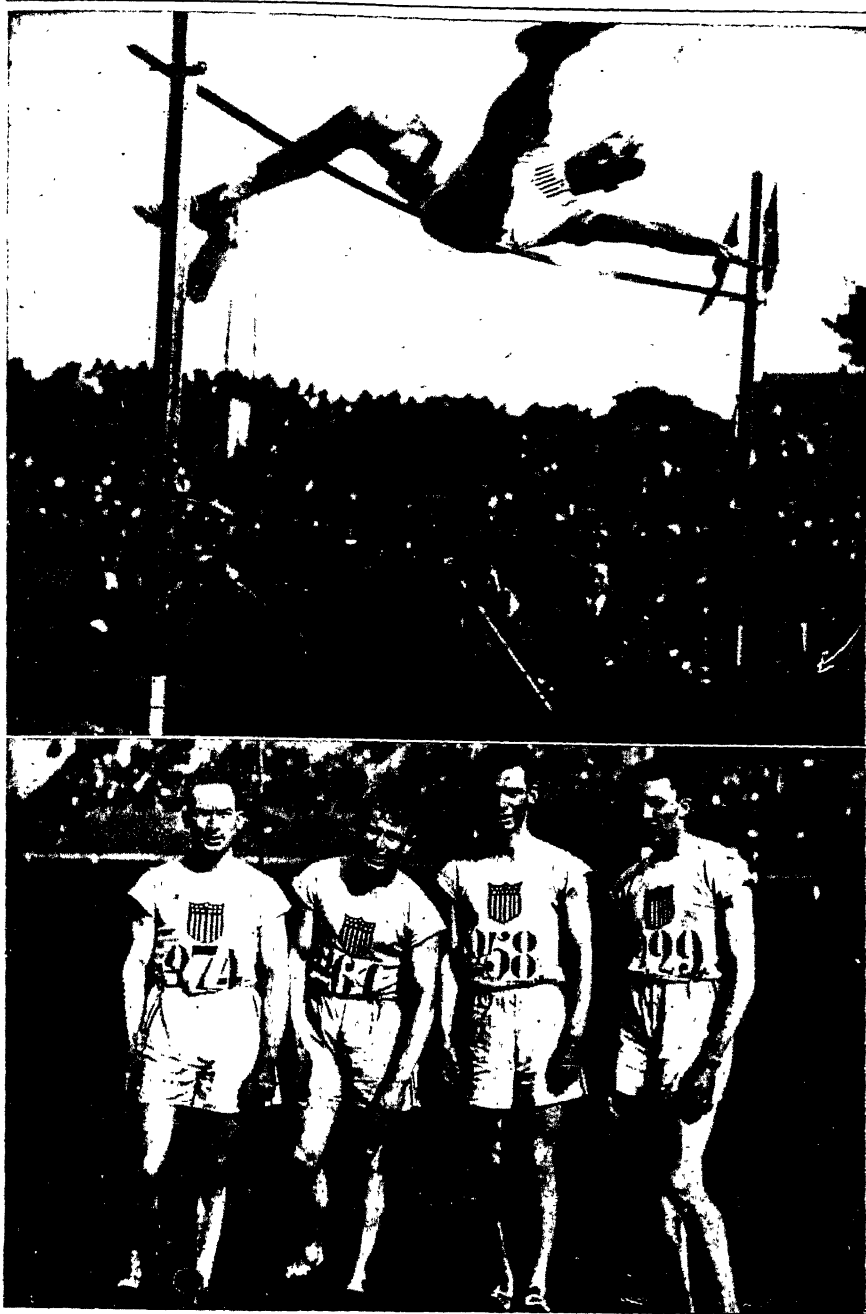
**Oliphant, Margaret Oliphant Wilson** (1828-97), English novelist and biographer, was born at Wallyford, near Musselburgh. In 1852 she married her cousin, Francis Oliphant. Gaining attention with her clever Scottish story, *Passages in the Life of Mrs. Margaret Mailand* (1849), Mrs. Oliphant made a great impression with *Katie Stewart* (1852). After this she wrote a great number of popular novels and biographies. See her *Autobiography and Letters*, edited by Mrs. Coghill (1899).



*The Olive.*

1, Corolla, open; 2, calyx; 3, pistil; 4, fruit; 5, stone.

**Olive**. The wild olive (*Olea europæa*) is a native of the Mediterranean countries, and has gradually become naturalized elsewhere, under similar climatic conditions. The olive has sharp and slender leaves of a grayish green. **OLIVE OIL** consists chiefly of trioleine  $C_3H_5(OCOC_{17}H_{33})_3$ , which is the glycerol ester of oleic acid, obtained from *Olea europæa* by expression of the dried fruit.



© *Wide World Photos.*

*Olympic Games, Amsterdam.*

Upper, Brown of U. S. in High Jump. Lower, Scholz, Paddock, Norton and Hill, American Sprinters.

**Olives, Mount of, or Olivet**, a rising ground to the E. of Jerusalem, over against the Temple hill, and separated from it by the Kidron valley; now called Jebel-et-Tur (2,700 ft.).

**Ollivant, Alfred** (1874-1927), Eng. author, wrote the dog story classic, *Bob, Son of Battle* (1898); *Tomorrow* (1927).

**Olmsted, Charles Tyler** (1842-1924), American prelate, acted as assistant in Trinity parish, New York (1868-84); rector of Grace Church, Utica (1884-99); vicar of St. Agnes' Chapel, New York (1899-1902); bishop coadjutor of Central New York (1902-4), and bishop from 1904.

**Olmsted, Frederick Law** (1822-1903), American landscape architect, was born in Hartford, Conn. In 1857 the plan offered by Olmsted and Vaux for laying out Central Park, New York City, was accepted. After that time he was connected with the laying out of many great city parks, and Jackson Park, Chicago, included in the World's Fair of 1893, and afterward one of the most beautiful parks of the city.

**Olmsted, Frederick Law** (1870- ), American landscape architect, son of F. L. Olmsted, was born on Staten Island, N. Y. From 1910-19 he was president of the National Conference on City Planning and a member of the National Commission of Fine Arts, and is governor of the American City Planning Institute.

**Olney, Richard** (1835-1917), American lawyer, was appointed U. S. Attorney-General in the Cabinet of President Cleveland in 1893. In 1895 he became Secretary of State, and carried to a successful issue the Venezuela controversy with Great Britain.

**Olonets**, former government, North Russia, extending from Lake Ladoga almost to the White Sea, now included in the Karelian Autonomous Socialist Soviet Republic.

**Olongapo**, U. S. naval station, Zambales province, Luzon, Philippine Islands.

**Olympia**, religious center in Elis, ancient Greece, at the junction of the Alpheus and Gladeus Rivers. Here were held the famous Olympic Games. The Temple of Zeus is said to have been built in the 5th century B.C. from the spoils of the city of Pisa. In it stood Phidias' gold and ivory statue of Zeus, 40 ft. high, one of the seven wonders of the world, which was removed to Constantinople and destroyed by fire in the 5th century. The Hereon, the oldest known Greek temple, is supposed to date from the 7th century B.C.

Among its ruins was found the Hermes of Praxiteles.

**Olympiad**. The period of four years which elapsed between celebrations of the Olympic games became the most general method of reckoning time among the ancient Greeks after its introduction by the historian Timæus, who flourished about 265 B.C.

**Olympic Games**, athletic contests held in ancient Olympia from immemorial antiquity; also the modern international athletic contests begun in 1896, and held every four years. The traditional list of victors in the contests began in 776 B.C. The games were held every four years, at the first full moon after the summer solstice. The festival lasted five days. The earliest and most important contest was the stadion, or short foot race of about 200 yards. There were later introduced at different intervals the diaulos, or race of twice the length of the stadion; the long race of twenty-four stadia; wrestling; the pentathlon, or all-round contest in running, leaping, throwing the quoit, the javelin, and wrestling; boxing, the pancratium; the chariot race for four horses; the horse race; boys' contests in running, wrestling, and boxing; the foot race in heavy armor; the chariot race for two horses; chariot race for two and for four foals; contests for heralds and trumpeters; a foal race; and a boys' pancratium.

As the games developed, one of the most important features came to be the contests in oratory, painting, sculpture, and music. Only free-born Greeks were allowed to compete until the period of Roman domination, when the games became cosmopolitan in character. The competitors were required to undergo a preparatory training for ten months in the gymnasium at Elis, and during the last of these months the gymnasium was almost as numerously attended as the games themselves. The period of the games covered five days, the principal contests taking place on the third day. The fifth day was set apart for processions, sacrifices, and banquets to the victors. On his return home the victor was received with extraordinary distinction. Theodosius I. prohibited the games in 394 A.D. Theodosius II. ordered the buildings to be burnt.

Modern revivals of the Olympic games, in which contestants from almost all of the civilized world took part, were held in Athens in 1896 (in the ancient stadium, specially prepared for the purpose). Paris in 1900, at the St. Louis Exposition in 1904, in Athens in

1906, London in 1908, Stockholm in 1912, Antwerp in 1920, Paris in 1924, Amsterdam in 1928, and Los Angeles in 1932. With a few exceptions, such as the discus throw, these contests are modern in character without attempt at adaptation of the ancient sports.

To see the tenth contest, held in Los Angeles, California, from July 30 to August 14, 1932, more than 1,000,000 people paid a total of \$2,000,000, which figures were more than twice those for any previous Olympic games. Vice-President Curtis of the U. S. proclaimed the opening of the games, in which 2,000 athletes from 27 nations took part.

The United States led the field by far, scoring 39 first places and 202 unofficial points. Italy, second, won 9 firsts and 62 points. The United States won unofficial team championships in men's and women's track and field events, women's swimming, boxing, rowing, catch-as-catch-can wrestling, and the official team title in the three-day equestrian events.

The marathon was won by an Argentine, Zabala, in 2 hr. 31 min. 36 sec., an Olympic record. Lehtinen (Finland) was credited with a first in the 5,000-metre at 14:30, an Olympic record. Hampson (England) set a world's record for the 800-metre, at 1:49.8.

In the little German town of Garmisch-Partenkirchen, in the Bavarian Alps, athletes participated in the fourth Winter Olympic Games February 7-16, 1936, before a paid attendance of 800,000 persons. The countries whose representatives gained first place were: Norway (4), Germany (2), Sweden (2), United States (2), Austria (1), Finland (1), Great Britain (1), and Switzerland (1). The United States Two-man Bobsled Team, composed of Ivan Brown, driver, and Alan Washbond, brake, retained their championship status.

August 1-16, 1936, Olympic Summer Games, Eleventh Olympiad, were held at Berlin. The sports area contained 100,000 seats for spectators. Sports which could not be performed at the Arena were conducted elsewhere viz.: rowing at Grunau, rifle shooting at Wannsee, yachting in the Kiel Bay.

An interesting highlight was the method used to light the Olympic Flame in the Arena. A relay of over 3,000 torch bearers carried fire for a distance of about 2,000 miles, from historic Olympia in Greece—scene of the first Olympic struggles—through Greece, Bulgaria, Yugoslavia, Hungary, Austria and Czechoslovakia, to Berlin. Starting July 20 the relay was completed August 1. During this time various national capitals staged demon-

strations stressing the value and importance of the modern international athletic feats. In Berlin at the scene of the Games, Chancellor Hitler was present at dedicatory exercises. The President of the American Committee was Avery Brundage.

The track and field events were dominated by a U. S. negro, Jesse Owens. He won three individual first places, set two Olympic records, and was a member of the U. S. 400-Meter Relay Team which took first place and broke both the Olympic and world records for this event.

Countries represented in the 1936 Summer Olympics were: Afghanistan, Argentina, Australia, Austria, Belgium, Bermuda, Bolivia, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Czechoslovakia, Denmark, Egypt, Estonia, Finland, France, Germany, Great Britain, Greece, Haiti, Hungary, Iceland, India, Italy, Jamaica, Japan, Latvia, Lichtenstein, Luxemburg, Malta, Mexico, Monaco, Netherlands, New Zealand, Norway, Panama, Peru, Philippine Islands, Poland, Portugal, Roumania, South Africa, Spain, Sweden, Switzerland, Turkey, United States, Uruguay, Yugoslavia.

Excluding the decathlon the countries gaining first place were: Germany (26), United States (22), Hungary (10), Finland (7), Italy (7), France (6), Japan (6), Netherlands (5), Sweden (5), Great Britain (4), Argentina (2), Austria (2), Czechoslovakia (2), Egypt (2), Estonia (2), Canada (1), Chile (1), India (1), New Zealand (1), Norway (1), Switzerland (1), Turkey (1).

In the decathlon the final point standing of the first four men was:

(1) Morris, United States 7,900 points.  
Olympic and world record.

(2) Clark, United States	7,601
(3) Parker, United States	7,275
(4) Haber, Germany	7,097

The 1940 Games were originally awarded to Japan, which nation, because of the financial strain of the China War, relinquished its claim in 1938. Finland was next chosen as the locale of the Games but the Russian invasion of that nation in Dec., 1939, made that selection impossible.

**Olympus**, a mountain range in ancient Greece, dividing Thessaly from Macedonia. In Greek mythology it was regarded as the abode of the gods.

**Olynthus**, a colony from Chalcis in Euboea, in the Chalcidice it was destroyed by Philip in 348 B.C.

**Omaha**, city, Nebraska, county seat of



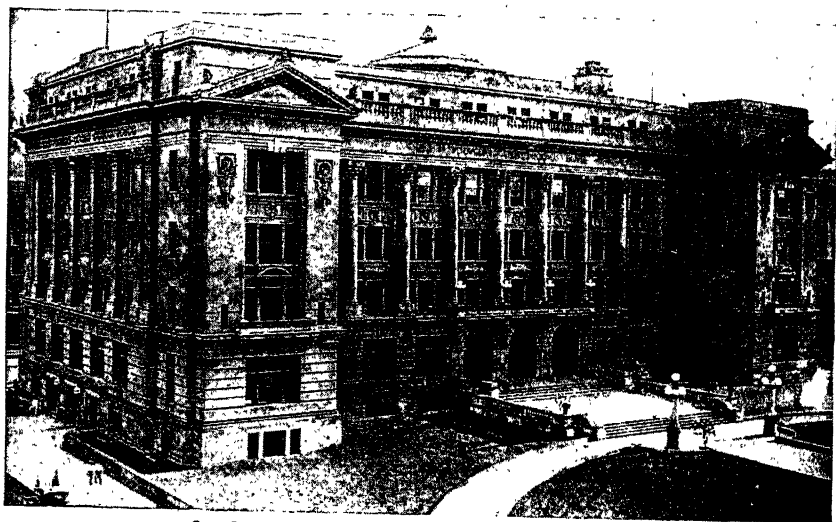
Douglas co., and the commercial and industrial metropolis of the State; 430 m. s.w. of Chicago; on the Missouri River. It is situated on high ground, rising from the west bank of the river, which the business section adjoins, and has an average altitude of about 1,000 ft. above sea level. Conspicuous features are the three great bridges which span the river to Council Bluffs, Ia. The city's area is 39 sq. m.

Omaha has 30 parks, having an aggregate area of 3,600 acres. Noteworthy buildings are the Federal Building, an imposing structure in Romanesque style, erected at a cost of \$1,845,000, the Auditorium, with a seating capacity of 12,000, three high schools, and the new (\$4,200,000) Union Station. The public li-

and roasting of coffee and spice. Railroad shops employ a large number of men. The slaughtering and meat-packing houses in South Omaha vie with those of Kansas City for second place in the country, in point of size.

Fort Crook and Fort Omaha are permanent posts of the U. S. Army. The city has a municipal and a commercial airport and is the headquarters of the air-mail branch of the postal service. It has the commission form of government; p. 223,844.

**Omahas**, North American Indians, a branch of Sioux stock, but not members of the Dakotan alliance, with which they were often at war. They are now, with the Winne-



*Omaha, Nebraska: Douglas County Court House.*

brary contains about 193,700 volumes and a large collection of coins, art works, and manuscripts.

Omaha is known as the 'Gate City,' a name of especial significance in view of the great territory to the west, of which it is an important market and railroad center. The grain exchange was established in 1904. Other goods distributed are manufactured products, and an increasing quantity of domestic fruits from the w. and s. Important manufactures include dairy products, bread and other bakery products, lumber, flour, bags (other than paper), boots and shoes, steam railroad cars, and illuminating and heating gas. Other large industries and copper and lead smelting and refining plants, printing and publishing establishments, car repair shops, and the grinding

bago Indians, on a reservation in Northeastern Nebraska.

**Omaha, University of**, a Presbyterian institution of learning for both sexes at Bellevue, Nebraska, founded in 1880 as Bellevue College. The College consists of the Collegiate and Graduate Departments, Normal School, Academy, School of Music and Art, and summer session.

**O'Mahony, John Francis** (1816-77), Irish Fenian agitator, was born in Ireland. His share in the Irish rebellion of 1848 forced him to seek refuge in France, whence in 1852 he emigrated to the United States. He settled in New York City, where in 1858 he began the movement which resulted in the organization of the Fenian Brotherhood, of which he was president for several years. He published a

translation of Geoffrey Keating's Gaelic *History of Ireland* in 1858.

**Oman**, a state in Southeast Arabia, with an estimated area of 82,000 sq. m. There are no rivers. The climate is very hot and dry and irrigation is necessary for agriculture, for which only one-tenth of the area is suitable. Agriculture and fishing are, however, the chief occupations. Camels are bred. The population consists chiefly of Arabs and negroes.

**Omar Ibn Al-Khattab** (c. 581-644 A.D.), second calif of the Mussulmans. He started the Mohammedan system of reckoning dates from 622, the year of the Hejira; and was the first to assume the title 'Commander of the Faithful.'

**Omar Khayyám**, Persian poet, was born about the middle of the 11th century at Nishapur, Khorassan, where he died about 1123. He lived 'busied in winning knowledge of every kind.' As an astronomer he was responsible for a revision of the Persian calendar. He wrote a number of works on mathematics. It is, however, as the author of a collection of quatrains, called the *Rubáiyát*, that Omar Khayyam is more popularly known. These poems—isolated, impulsive, unrestrained, and characterized by rapid transitions from love minstrelsy to grave argument, and from a deadly fatalism to ribald tavern song—are an interesting development of Persian mysticism. As with the Song of Solomon, some interpret them literally, others find in them veiled meanings and a mysterious Sufism.

The *Rubáiyát* was practically unknown in the West until the publication, in 1859, of an English translation by Edward FitzGerald. FitzGerald's work has been called a 'poetic transfusion' rather than a translation. The translation by E. H. Whinfield, follows the original much more closely than FitzGerald.

**Omdurman**, town, Anglo-Egyptian Sudan, on the left bank of the Nile, at the mouth of the White Nile, opposite Khartum, with which it is connected by a steam ferry. The town is an important gum market, receiving gum by caravan from the Kordofan Desert, and is noted for its silver filigree work; p. about 80,000.

**Omen**, an event which is supposed to foretell future happenings. From the earliest times a belief in 'signs' as the forerunners of great events has been almost universal, especially in regard to the important events of life—birth, marriage, death. Good or bad fortune is foretold by all manner of trivial events, such as the cracking of a loaf across the top in baking, seeing a black cat, and so on.

**Omnibus**, a public conveyance, owing its inception to Pascal (1662), and its name (Latin, 'for everybody') to Baudry of Nantes (1827). It made its appearance in Paris, New York, and London about the close of the first quarter of the 19th century.

**Omnibus Bill**. See **Compromise Measures** of 1850.

**Omphale**, in ancient Greek legend, the wife of Tmolus, king of Lydia, who after his death reigned as queen. As an atonement for the murder of Iphitus, Hercules was forced to become her servant for a period of three years, during which time he is said to have used the distaff and spun wool, clad in feminine apparel, while Omphale donned his lion's skin and bore his club.

**Omphalodes**, a genus of hardy herbaceous plants, of the order Boraginaceæ. The species are of easy cultivation and thrive in partial shade. Among the best known are the annual Venus' navelwort, and the creeping forget-me-not.

**Omri**, king of Israel, its first powerful ruler after the separation of the two kingdoms of Israel and Judah. His reign (c. 885-874 B.C.) was warlike.

**Omsk**, town, Siberia, in U. S. S. R. Features of interest are the cathedral, governor-general's palace, and fortress. The industries include brick and pottery works, breweries and distilleries, tobacco, oil, and soap manufacturing. Butter, bacon, poultry, fish, eggs, and hides are largely exported. The climate is very cold; p. 166,400.

**Onager**, or **Ghorkhar**, a variety of the Asiatic wild ass found in Western India and Baluchistan. It is pale in color, has a broad, dark stripe down the back. It is extraordinarily fleet, and cannot be overtaken by a horseman.

**Onega Lake**, a lake of North Russia; area, 3,765 sq. m.; its extreme length, 145 m.; its breadth 50 m.

**Oneida**, city, in north central New York, in Madison co., 27 m. n.e. of Syracuse. Its industries include canning houses, furniture, casket, steel pulley, silverware, cigar, bottle cap, and automobile factories, and other manufactures. In the vicinity is the ancient castle of the Oneida Indians and here in 1847 the Oneida Community was established by John N. Noyes; p. 10,291.

**Oneida Communities**. See **COMMUNISM**.

**Oneida Indians**, one of the original five tribes forming the Iroquois nation. They took their name from the Oneida Stone, a granite

boulder near one of their villages. A few of them still reside upon reservations in the State of New York. The Oneida number about 3,200, of whom two-thirds are in Wisconsin.

**Oneida Lake**, a lake of glacial origin in Central New York, about 22 m. long and 6 m. wide. It finds an outlet through Oswego River to Lake Ontario.

**O'Neill, Eugéné Gladstone** (1888- ), American playwright. After acting in vaudeville and doing newspaper reporting, he devoted himself to playwriting. He has become the outstanding American dramatist, three times winning the Pulitzer prize: 1920, *Beyond the Horizon*; 1922, *Anna Christie*; 1928,



Eugene O'Neill.

*Strange Interlude*. Other plays are *Emperor Jones* (1921); *The Hairy Ape* (1929); *Desire under the Elms* (1924); *Marco Millions* (1924); and *Ah, Wilderness* (1933). Critics and commentators at home and abroad were well satisfied with the 1936 award of the Nobel Prize for literature to Eugene O'Neill. His play, *Mourning Becomes Electra*, was presented in Stockholm at the time of the Nobel festival marking the presentation of awards.

**O'Neill, Hugh** (c. 1540-1616), Earl of Tyrone, Irish soldier. He headed a rebellion against Elizabeth in 1597 and at first met with some success, but was defeated by Mountjoy. After the capture of Kinsale he gave his allegiance to the English crown and was pardoned. Later he renewed his intrigue with Spain and in 1607 was exiled.

**O'Neill, James** (1847-1920), actor, born in Ireland. From 1875 to 1877 he was leading man at the Union Square Theatre, New York. Later he starred in various parts, including D'Artagnan in *The Three Musketeers*, and Shakespearean rôles. He was the father of Eugene O'Neill.

**Oneonta**, city, New York, in Otsego co., 60 m. n.e. of Binghamton. It is the seat of a State Normal School. Among its manufacturing establishments are railroad machine shops, knitting and planing mills, cigar factories, silk mill, and foundries; p. 11,731.

**Onesimus, St.**, one of St. Paul's disciples, suffered martyrdom A.D. 95. February 16 is dedicated to him.

**Onion** (*Allium cepa*), an important garden vegetable, originating in Southern Asia. It has been highly esteemed as an article of food from earliest times, and is grown universally where the climate will permit. Almost any soil can be made to grow onions, if plenty of humus is supplied, with proper fertilizers. The best soil is a firm, clayey loam with considerable sand. The crop from seed requires from 130 to 150 days for maturing. The prime necessity in the cultivation of the crop is absolute freedom from weeds. The varieties grown for the general market are the white and yellow globe types (of various local names) and the red Wethersfield.

The *Bermuda*, *Egyptian*, and *Spanish* varieties are grown in Southern California, Texas and Florida, and in the alluvial lands of the Mississippi delta. 'Top onions' and 'multipliers' are used to furnish the early green onions. Onion 'sets' are used to secure an earlier crop, and to escape the more troublesome cultivation from the seed.

**Onkilon**, legendary tribe of Northeast Siberia, dwelling about East Cape on Bering Strait. They are supposed to have been nearly exterminated by Chukche invaders about three centuries ago. Their mound dwellings, with their stone axes and chisels, slate knives, and spear heads are described by Baron Nördenskiöld in his *Voyage of the Vega*.

**Onnes, Heike Kamerlingh** (1853-1926), Dutch physicist, made remarkable discoveries in regard to the electrical resistance of certain metals at temperatures only a few degrees above zero. In 1913 he was awarded the Nobel prize in physics.

**Onomatopoeia**, in philology, the formation of a name or word by an imitation of the sound associated with the thing or action designated—as 'whizz.' It has a similar significance in rhetoric.

**Onomichi**, seaport, Japan. It has a fine harbor and is a picturesque town with many fine old temples. Fancy mattings are the chief article of export; p. 27,740.

**Onondaga Indians**, one of the most important members of the Iroquois nation, enjoying the prestige of having for a chief the

traditional Hiawatha, who organized the five tribes of Iroquois into a nation. Their original territory was in the vicinity of the lake and creek bearing their name, in the present Onondaga co., N. Y.; and their chief village was regarded as the capital of the Iroquois Confederacy. The name Onondaga, or people of the hill, still survives as the name of a town not far from the old site. About 600 still reside upon the Iroquois reservation in the State of New York.

**Ononis**, a genus of mostly herbaceous, European plants belonging to the order Leguminosae. There are some seventy species, many of which make good plants for borders and rock gardens.

**Onopordon**, a genus of hardy herbaceous plants of the order Compositæ. The best-known species is the common Scotch Thistle or Cotton Thistle.

**Ontario**, the second largest province of the Dominion of Canada, in the central part; area, 412,582 sq. m.

Ontario is divided into two main geographical divisions—Old Ontario, well settled, with splendid farms, rich fruit lands, and a variety of established industries, lying to the s. along the St. Lawrence River and Lakes Ontario and Erie; and New Ontario, comprising an extensive domain in the northern section of the Province, covering an area of 330,000 sq. m. The surface is undulating. There are no considerable ranges of hills, although there is a watershed of elevated land separating the basins of the Ottawa and the St. Lawrence. This hummocky plateau, sometimes called the Laurentian Highlands, or the Height of Land, rises to 1,200 ft. The principal rivers are the Ottawa, and the St. Lawrence, which forms part of the boundary between Ontario and the United States. The largest lakes are Nipigon, Nipissing, Abitibi, the Lake of the Woods, and Rainy. The principal bays are the Georgian, Nottawasaga, Burlington, Quinte, Long Point, and Owen Sound.

The northern and northwestern part (New or Northern Ontario and the Patricia District) contains extensive forests, a considerable area suitable for agriculture, and important mineral deposits.

In the peninsular portion of the province there are no extremes either of heat or cold. The summer is warm and sunny, and the cold in winter is modified by the presence of the lakes. The snowfall is light. In the n. and w. the snowfall is much heavier, and the winters are cold, but dry and clear, with a large proportion of sunny days. In the far n. and n.w.

the modifying effect of Hudson Bay is felt. The average temperature for two representative parts of the province is as follows: Toronto—summer, 65°, winter, 23°; Port Arthur—summer, 59°, winter 7°. In the peninsular portion the soil is very fertile, and the Clay Belt of the n.w. offers excellent returns to tillage. The clay lands are the beds of post-Glacial lakes.

Of trees, the most numerous and valuable are white and red pine, yellow and paper birch, maple, hemlock, ironwood, beech, black ash, basswood, cedar, spruce, tamarack, and alder. In the n. most of the trees are conifers.

Animals indigenous to the province are moose (rare), deer, beaver (protected), bears, wolves, minks, otters, martens, and muskrats.

The Province has immense mineral wealth; but portions of the territory are remote from trading centers, and the exploitation of their mineral resources is difficult and expensive. The chief minerals being worked are iron, gold, silver, nickel, cobalt, salt, petroleum, natural gas, copper, cement and lime.

Ontario is Canada's wealthiest agricultural province. Wheat, oats, hay, barley, peas, rye, buckwheat, beans, potatoes, beets, and turnips are extensively raised, and the fruit crops are large and profitable, especially in the lowlands. The land along the northern coast of Lake Erie is agriculturally the most productive in the Province. Grapes, peaches, and small fruits of excellent quality are grown here in abundance. The rich soil and warm climate of the southern counties of Ontario are very favorable to the production of excellent grades of tobacco. The climate and soil are particularly favorable to the growing of succulent grasses and hay, roots, and grain as foodstuffs for cattle, and the average farmer combines the raising of livestock and poultry with general farming. Stock raising and dairying are important. The chief water routes of Ontario has always been the St. Lawrence and Great Lakes System. Notable among the artificial waterways constructed to aid navigation are the Welland Canal, the Sault Ste. Marie Canal, the Cornwall Canal, the Rideau Canal and the Trent Valley Canal.

Ontario possesses more than half the industrial capital invested in Canada; and manufacturing is becoming an increasing source of wealth in the province. The availability of cheap power in the province has acted as a tremendous stimulus to industrial activity. The most important manufactured products are flour and its by-products, automobiles, meats and their by-products, pulp and paper, butter

and cheese, electric light and power, rubber goods, electrical apparatus, castings and forging, sawmill products, hosiery and knit goods, clothing and agricultural implements.

The system of education is liberal, thorough, and progressive. The schools are free; education of children between five and sixteen years of age is compulsory; and all teachers must be certificated. The course of study and the text books for all publicly-controlled schools are uniform, and the whole system is carefully graded. Excellent collegiate institutes or high schools are maintained for secondary education in more than 300 places, where instruction is given free. There are also seven normal schools for the training of teachers, and in addition the University of Toronto has a faculty of education for the purpose of training teachers for high school work. For higher education there are the University of Toronto (the provincial university); the University of Ottawa, under the control of the Roman Catholics; Queen's University, Kingston; Western University, London; and McMaster University, Toronto, under the control of the Baptist denomination. The chief Agricultural College of the province is at Guelph. Separate Roman Catholic schools are the result of a political compromise, and were conceded as one of the conditions which facilitated the entrance of Ontario into the Confederation in 1867.

The population of Ontario is about 3,690,000. Toronto, with a population of 631,200, is the provincial capital. Other cities are: Ottawa, Hamilton, London, Brantford, Kingston, Windsor, Kitchener, Sault Ste. Marie, and Peterborough. The leading religions are the Methodists, Anglicans, Presbyterians, and Roman Catholics.

The affairs of the province are administered by a Lieutenant-Governor appointed by the Governor-General-in-Council for five years. He is advised by an Executive Council of twelve members. The judicial system consists of a Supreme Court of Judicature, including the Court of Appeals and the High Court of Justice (with King's Bench, Common Pleas, Chancery, and Exchequer Divisions), and county and division courts. The judges are appointed by the Governor-General-in-Council. Ontario is represented in the Canadian House of Commons by 82 members, and in the Senate by 24.

After the American Revolution, a considerable number of settlers, estimated at some 20,000 (The United Empire Loyalists), crossed the St. Lawrence and Niagara frontier and became the real founders of Ontario.

**Ontario, Lake**, the most easterly and the smallest of the Great Lakes of North America. It is 190 m. long, 55 m. wide, and has an area of 7,240 sq. m. Its outlet is the St. Lawrence River, which issues from its northern end. It is connected with Lake Erie by the Niagara River and the Welland Canal; with the Ottawa River by the Rideau Canal; and with the Hudson River by the Oswego Canal.

**Ontology**, the term formerly used to denote the most general part of metaphysics in which the more general or fundamental philosophical conceptions, such as possibility, necessity, causality, etc., were explained. But the term ontology is often applied to metaphysics generally, and is sometimes used to imply empty speculation in a region beyond the reach of real knowledge.

**Onyx**, a banded variety of agate, in which the colors are arranged in nearly straight and parallel stripes. The commonest colors are gray or dark gray and white, but red, yellow, black, and green also occur, and many specimens have their colors modified or enhanced by artificial staining. Of late years a stone, known as onyx, but really a banded green, gray, and white variety of marble, has become popular in the manufacture of clocks and vases and for interior decoration.

**Oolite**, a stone composed of small, rounded grains resembling fish roe, and of concretionary or accretionary origin. When the grains are larger, the formation is also known as Peastone and Pisolite. The famous Bedford stone of Indiana is in part oolitic.

**Oology**, the science which deals with the eggs of birds. The oologist is concerned with the external characters for the most part—the size and shape of the egg, the number in a clutch, and the color and texture of the shell. See Reid's *North American Birds' Eggs* (1904), Gordon's *Eggs of the Native Birds of Britain* (1905), and Evans' *Birds* (1900).

**Ooze**, a term applied to certain deposits found on the floor of the ocean, which consist, in large part at least, of the hard parts of pelagic organisms. The most abundant is globigerina ooze. Globigerina is a member of the Foraminifera, and bears a delicate calcareous shell. The organisms live at the surface, and as they die their shells fall in a ceaseless rain to the sea-bottom. This ooze does not occur near the shore, where the deposits consist mainly of land-derived materials; and in polar regions it is replaced by diatom ooze, which is largely formed of the silicious frustules of diatoms. When the depth exceeds three thousand fathoms, globigerina ooze is re-

had been lost. With an able poet, Calzabigi, as librettist, he produced *Orfeo ed Euridice* (1762), and *Alceste* (1767, Vienna), to which he brought increasing dramatic power and consistently expressive music, and raised the orchestra to a more important place, one of real co-operation. In 1774 Gluck's *Iphigénie en Aulide* was produced in Paris. There ensued the famous conflict between the factions Gluckists and Piccinists, ending in Gluck's triumph, acknowledged by Piccini, in his opera *Iphigénie en Tauride*, set by both composers, Gluck in 1778 and Piccinni in 1781.

Italian operas continued in the latter half of the 18th century to pour forth the *opera seria* in its extreme form of formality and ostentation, with little musical or dramatic dignity. The first half of the 19th century was dominated by Rossini (1792-1868), a prolific, versatile writer, who, however, chose to dazzle with technical genius and superficial brilliance rather than to impress by display of great musical or dramatic gifts. His *Guillaume Tell* (1829) was his least affected work, one of much genuine worth. Donizetti (1797-1848) in tragic mood, with about 65 operas, and the poetic Bellini (1801-35) mirrored somewhat feebly Rossini's strength in the prevailing type of opera that was soon to undergo changes.

The genius of Verdi (1813-1901) manifested itself through three successively growing styles, the first ending about 1850, the second ten years later. His first series, beginning with *Oberto* (1838), included some 15 works, which, though following beaten paths, still showed an individual impress. After a trip to London and Paris, the result of wider contacts became apparent in *Rigoletto* (1851, Venice), *Il Trovatore* (1853, Rome) and *La Traviata* (1853, Venice), the last bringing him international renown. Influenced by Wagner though not servilely copying him, he produced the more solid operatic structures, *Aida* (1871), *Otello* (1887), and *Falstaff* (1893). The last, finished in his eightieth year, put Verdi in the first rank of opera composers. Verdi's great melodic gift, sincere purpose, dramatic sense and orchestral instinct combined to produce his remarkable series of operas during a half century. The influence of Verdi is seen in a series of successors who, while not reaching his heights, have made certain notable contributions, especially the 'veristic' composers to whom realism meant much. Two of the ablest were Puccini (1858-1924), with *La Tosca* and *Madame Butterfly* and Mascagni (1863-1945), with *Cavalleria*

*Rusticana*. Wolf Ferrari (1876-) in *Jewels of the Madonna* is also 'veristic.'

In France the ballet was the forerunner of opera. The first French opera to be publicly given in Paris was Cambert and Perrin's *Pomone*. Lully's expansion of the overture into a three-part structure and his fusion of the Italian and French styles, as well as the development of ensemble climaxes, were important contributions, partly accounting for his great vogue. By 1700 Lully's works were still typical on the serious side, but there was increased interest in lighter entertainment, the ballet and the early form of *opéra comique*. The Gluck-Puccini debate intervened before *opéra comique* was developed into its later, more brilliant examples. The transition to grand opera proper was accomplished gradually by the adopting of accompanied recitative and concerted finales, producing works essentially French yet borrowing features from both Italian and German. Cherubini (1760-1842), an Italian, spent over fifty years in Paris, from 1780 to 1810 devoting much time to opera. Greater dignity of treatment and orchestral richness entered his works with increased dramatic effect. French grand opera required five acts, elaborate ballets in the second and fourth, no spoken dialogue nor bare recitative, but orchestral accompaniment throughout. Spontini is called the last of the classical operatic writers. His works abounded in heavy orchestration and vocal difficulties, and ran to great length, anticipating Meyerbeer and Wagner.

Meyerbeer (1791-1864) came early under Italian and later under German influence. To German harmonic solidity he added a facile Italian melodiousness and French rhythmic grace. *Les Huguenots* (1836, Paris) and *Le Prophète* (completed 1843, produced 1849) are foremost. With him the effective, not the ideal, ruled. To the prolific dramatist Scribe, his librettist, he owed much.

Halévy (1799-1862) in *La Juive* (1835, Paris) reflected Meyerbeer's influence. Thomas (1811-96) started with a series of *opéras comiques*, but evolved more enduring works in *Mignon* (1866) and the grand operas *Hamlet* (1868) and *Francesca de Rimini* (1882), modern in conception and execution. In Gounod's (1818-93), *Faust* (1859) and *Romeo et Juliette* (1867) the romantic element is evident.

Bizet (1838-75) adapted leading motives to excellent purpose in his brilliant *Carmen* (1875), a work vitally alive to-day. Char-

pentier (1860- ) in his *Louise* (1898, Lille) made his score reflect the atmosphere of Paris with amazing success. Massenet (1842-1912) is best known in *Thais* (1894), *Herodiade* (1881), and *Manon* (1884). Saint-Saëns (1835-1921), a versatile, prolific composer, produced about 10 operas, *Samson et Dalila* (1877, Weimar), of rare melodic charm and orchestral interest, a work in which many styles are blended. With Debussy (1862-1918) a distinct French note is struck. The impressionist is at work creating inchoate melody and nebulous harmony in his effort to recreate the atmosphere of Maeterlinck's *Pelleas et Mélisande* (1902). His work has been said to be lacking in vitality and variety, in solid structural qualities, and to be too orchestral; but many to whom the overpowering sonority of Wagner is unwelcome find the rare charm and delicate nuances amply compensatory. Dukas (1865-1935) in *Ariane et Barbe-Bleue* (1907), combines orchestral coloring and vivid impressionism to produce a certain heaviness without the subtlety of Debussy. Ravel (1875-1937), an impressionist working in miniature, has written *L'Heure Espagnole* (1911) and an unheard opera *La Cloche Engoulée*.

The operas of Mozart (1756-91) show the same versatility that is seen in his other works. Melodic wealth, splendid characterization, and dramatic effects were often lavished upon plots light and humorous. *Le nozze di Figaro* (1786, Vienna) is among his best.

Beethoven (1770-1827) cast his only opera *Fidelio* (1805, Vienna) in the *Singspiel* form. 'Symphonic rather than dramatic talents here show themselves, and highly eloquent music is developed at the expense of dramatic movement. The romantic opera came into full existence in Weber (1786-1826), who brought to writing a strong love of German folksong, wide knowledge of many styles, and a powerful imagination. He was an important link between Gluck and Mozart and Wagner. Against the hollowness of much of the Italian opera, his works were protests for which the public was ready. A master of stagecraft as of musical resources, Weber wrote a series that puts him in the first rank. *Der Freischütz* (1820, Dresden), *Euryanthe* (1823, Vienna), *Oberon* (1826, London), and others, are among our best heritage. His treatment of the overture—a more significant and organic part—was a notable addition. In the new form the strict recitative was rare, declamatory passages were freely used, and the aria robbed of its stiffness. When Wagner (1813-83) appeared, the new

elements of romanticism, dramatic sincerity, and improved orchestral resources were ready for use by a highly eclectic mind. Wagner turned for his inspiration to Teutonic mythology. Here his rich imagination and love of symbolism could have free play not only in the music that was to develop the highest individuality but in the creating in his own librettos—a decided innovation—a high form of dramatic poetry. His theory is that opera should consist of a union of language, action, and music, inseparably wrought into unity. The orchestra, the elaborate organization we know today, he raised to a prominence hitherto unknown. Growing steadily in technical power, he showed tremendous inventiveness in creation, devising new effects and developing elaborate *leit-motive*, characteristic bits of melody denoting personages and even emotions. On the structural side he expanded freely form, harmonic resources, and the polyphonic (many-voiced) element, in his efforts to gain more powerful expression. In direct contrast with Italian exaltation of vocalism, in Wagner's works the vocal parts are welded indissolubly into the whole, and become prominent only as required by the dramatic situations. The most important of his eleven major works are: *Lohengrin* (1850, Weimar); *Tristan und Isolde* (1865, Munich); the tetralogy of *Der Ring der Nibelungen*—*Rheingold* (1869, Munich), *Walküre* (1870, Munich), *Siegfried* (1876, Bayreuth), *Götterdämmerung* (1876, Bayreuth); *Parsifal* (1882, Bayreuth).

Richard Strauss (1864- ), a technical genius of great power but uneven in the quality of his work, has written about 11 operas, including *Salome* (1905) and *Rosenkavalier* (1911), considered very excellent, and *Egyptian Helen* (1928).

From about 1728 on in England the 'ballad-opera' was in vogue, with Pepusch's (1667-1752) *The Beggar's Opera* (1728), a pioneer work. In the brilliant comic-operas of Gilbert and Sullivan wit and music are happily combined to produce such works as *Patience* and *The Mikado*, an outgrowth of Offenbach's works in opera-bouffe style. They were written between 1870 and 1890. Richard D'Oyly Carte began producing these operas in 1875 and in 1934 his son Rupert brought the D'Oyly Carte company to the United States where they were enthusiastically received in New York and elsewhere.

With Glinka (1803-57) the modern Russian school begins. His *Life for the Tsar* (1836, Petrograd) shows slight Italian influence, but is very Russian in its strange rhythms and in

the use of folk-song and the author's own folk-like (lyrical) melodies. Great advance is seen in *Ruslan and Ludmilla* (1842). Moussorgsky (1839-81), after much preliminary work, produced *Boris Godounoff* (1874, Petrograd), sketchy, nationalistic, and intensely dramatic. Rimsky-Korsakoff (1844-1908), has technical mastery of orchestral coloring and lyrical creativeness, in the transcription of Russian life and feelings as in *The Golden Cockerel* (1910). Borodine's (1834-87) *Prince Igor* (1891) follows the lyrical conventional manner. Tchaikowsky (1840-93), another cosmopolitan, wrote many operas of which *Eugene Onegin* (1879) is the most spontaneous. The strongly futuristic Stravinsky (1882- ), a pupil of Rimsky-

by Millay, 1927) and *Peter Ibbetsen* (1930); De Koven (1859-1920), Sousa (1854-1932), and Herbert (1859-1924) have written many comic operas of the better kind. America has not yet created great opera, but it has maintained a high level of performance, notably at the Metropolitan Opera House, New York City. American singers of note include Farrar (1882- ), Garden (1887- ), Whitehill (1871-1932), and Tibbett (1896- ). Of great importance in the development of American opera were Virgil Thompson's *Four Saints in Three Acts* (1934); Howard Hanson's *Merry Mount* (1934); and George Gershwin's *Porgy and Bess* (1935).

Consult Streatfield's *The Opera*; Pratt's



Opera: Lawrence Tibbett as 'The Emperor Jones.'

Korsakoff, in daring orchestral combinations, rhythms, and graphic effects, is one of the most potent forces at work to-day. He has written brilliant Russian music in the technically masterful ballet *The Firebird* (1910), and in a later ballet *Petroushka* (1911) satiric, pictorial, and iconoclastic. Prominent figures of modern Spain are: Albeniz (1860-1909), with *Pepita Jimenez* (1894) and *Enrico Clifford* (1895); Granados (1867-1916), impressionist, with several light works and the famous *Goyescas* (1916).

Some works by Americans are: Converse's (1871-1940) *Pipe of Desire* (1906), the first American work given at the Metropolitan Opera House, N.Y., and *The Sacrifice* (1911); Hadley's (1871-1937) *Cleopatra's Night* (1920); Taylor's *The King's Henchman* (book

*The History of Music*, and *The New Encyclopedia of Music and Musicians* (1924); Grove's *Dictionary of Music and Musicians* (5 vols.) and *American Supplement* (1920); Montagu-Nathan's *A History of Russian Music* (1914); Pougin's *A Short History of Russian Music* (1915); *The Art of Music* (vols. 3 and 9).

**Ophiuchus**, an ancient constellation stretching across the equator from Hercules to Scorpio, and generally identified with Æsculapius. The western branch of the divided Milky Way traverses the feet of Ophiuchus.

**Ophthalmia**, a general term for inflammation of the eye. It includes the various forms of conjunctivitis, trachoma, keratitis, and other inflammatory conditions.

**Ophthalmoscope**, an instrument specially



constructed to aid in minute examination of the eye, and particularly its interior. It consists of a small mirror, pierced in its centre by a small circular perforation. Concave and convex lenses are used with it. Atropine, or some other pupil dilator, is often used before examination.

**Opitz, Martin** (1597-1639), German poet. His most original work, *Buch von der deutschen Poeterei* (1624), was based in the main on the theories of the French *Pléiade*, and came to be accepted as the poet's handbook. He was also largely responsible for the introduction of 'pastoral' novels and Italian opera. He was called the 'Father and Regenerator of German poetry.'

China and although its importation was declared illegal in 1796, the traffic continued, efforts to suppress it leading to the Opium War of 1840-42. In 1907 a new effort was made to check the use of opium in China, India and the Philippines.

Late in 1909 President Taft suggested a conference at The Hague to give international effect and sanction to the resolutions of the Shanghai Commission, and to deal also with morphine and cocaine. The Conference met in 1912 and resulted in the conclusion of The Hague Opium Convention, providing for the gradual suppression of trade in prepared opium. By Article 23 of the Covenant of the League of Nations the 'supervision over the



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Oporto: The Harbor.

**Opium**, a powerful drug and one of the most valuable of medicines, consisting of the dried juice of the unripe capsules of *Papaver somniferum*, a species of poppy, of which several varieties are cultivated, the most usual in India, Persia, and China being the variety *album*. The milky juice is collected, air dried, and made up into cake, balls, or bricks. Opium has a bitter, nauseous taste, and a peculiar narcotic, heavy odor. Its exact composition varies greatly, but generally speaking it contains morphine, narcotine, thebaine, codeine, narceine, papaverine, and small amounts of other constituents. The action of opium depends on its alkaloids, and is chiefly determined by its morphine content. Over-indulgence in opium as an intoxicant is an ancient practice. Opium and morphine are used chiefly for their narcotic effect—the dulling of pain and easing of strain. Opium smoking is an oriental practice. The drug was early introduced into

execution of agreements with regard to . . . the traffic in opium' was transferred to the League of Nations, which in 1920 created an Advisory Committee on Traffic in Opium and Other Dangerous Drugs.

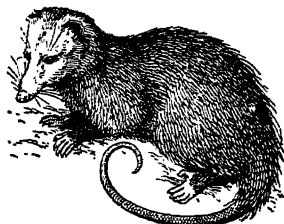
Several international conferences have been held since to consider limitation and suppression of production and use of opium. The two Conventions resulting from these two Conferences are revisions of the Hague Treaty of 1912 and replace the provisions of that treaty for the nations signing the new conventions. Those countries which do not ratify remain bound by the provisions of the 1912 treaty.

**Opoponax**, a gum resin obtained from a plant resembling the parsnip, native to Persia and found also in Southern Europe. It is used in perfumery.

**Oporto** (Portuguese *O Porto*, 'the port'), the second city of Portugal, stands on the steep, rocky bank of the River Douro, high above its

waters. An Atlantic harbor has been constructed at Lexoes, 4 m. farther n. The bridge of Dom Luiz i., a fine structure of one arch, with the enormous span of 525 ft., and carrying two roadways—one 35 ft. over the normal level of the stream, the other about 200 ft. above it—is one of the most magnificent bridges on the continent. The chief industries of Oporto are the manufacture of cloth and silks, hats, porcelain, ribbons, tobacco, soap, and candles, metal casting, tanning, brewing, distilling, cork cutting, sugar refining, and brick-making. The city is the centre of the port wine trade; p. 215,600.

**Opossum** (*Didelphys*). The name opossum has been applied to certain Australian forms, but is better restricted to the American opossums, which are the only marsupials found in America. They range from the United States to the Argentine Republic.



*Opossum.*

The largest and commonest species is the Virginian Opossum (*D. marsupialis*), the only species which extends into temperate North America. It is about the size of the cat, has a long, pointed snout, and is a foe to poultry yards. It is one of the species in which the pouch is complete. From six to sixteen young are produced at a time. Merian's Opossum (*D. dorsigerus*) is remarkable for the fact that it carries its young on its back, their tails being twined round the tail of the mother; many other species carry the young on the back. The opossums, like other marsupials, have a lowly organized brain; but they are remarkably cunning in robbing poultry yards; on the other hand, their stupidity in walking straight into the simplest and most obvious trap is more in accord with their brain structure. The expression 'playing 'possum' refers to the opossum's habit of feigning death when caught. At such times, though usually very timid, it will endure the severest torture, with no sign of suffering.

**Oppenheim, E. Phillips** (1866- ), author and novelist, was born in Boston, Mass. He has been for many years a popular and pro-

lific writer of detective and mystery stories, among the best-known or most recent of which are *The Amazing Partnership* (1917); *The Kingdom of the Blind* (1917); *The Great Impersonation* (1920); *Nobody's Man* (1923); *The Fortunate Wayfarer* (1928); *Inspector Dickens Retires* (1931); *The Ostrekoff Jewels* (1932); and *Murder at Monte Carlo* (1932); *Last Train Out.* (1940); *Milan Grill Room* (1940); *Sky Plutocrat* (1941).

**Opper, Frederick Burr** (1857-1937), Amer. illustrator, born in Ohio. From age of sixteen he lived in New York City. He was illustrator for *Puck* for eighteen years; on the staff of the *New York Journal* (now *American*); and illustrator for Bill Nye, Mark Twain, and others. Among his publications are: *Our Antediluvian Ancestors* (1902); *Alphonse and Gaston* (1902); *Happy Hooligan* (1902); *John Bull* (1903).

**Opsonic Index.** The class of immune bodies known as *Opsonins* has the property of facilitating the digestion of specific invading microbes by the phagocytes or scavenger cells. The opsonic index is determined by mixing the serum of the patient (the clear liquid of the blood from which the cells have been removed) with a culture of the specific bacteria in question and an emulsion of fresh human phagocytes prepared by centrifuging another sample of blood. From a theoretical standpoint, the opsonins constitute a class of bodies of peculiar interest, since they are soluble serum substances capable of stimulating the activity of the phagocytes.

**Optic, Oliver.** See Adams, William Taylor.

**Optical Illusion.** An object appears large or small, near or distant, according as the rays from its opposite borders meeting at the eye form a large or a small angle; when the angle is large, the object is either large or near; when small, the object must be small or distant. By reason of irradiation in the eye, the sun appears larger than it would if illumined by a fainter light, and a man in a white habit seems larger than he would if he wore a dark dress. Illusions are also produced by external causes; and instances of this sort are given under MIRAGE and REFLECTION AND REFRACTION.

The persistence of impressions on the retina for about one-sixth of a second after the object which produced the impression has been removed produces another class of illusions. The effect of continuous motion produced by moving pictures is based on the persistence of impressions on the eye.

**Optical Projection**, a method of producing on a screen a magnified illuminated image of a small picture. The picture is usually a photographic positive on a glass 'slide,' which can be slipped into position in the path of a beam of light focussed on the screen. The source of light is in the heart of the lantern, and may be either a limelight or an electric light. The use of the lantern, not only as a means of entertainment, but also as an important means of educational equipment, has greatly grown in recent years. Especially in the demonstration of microscopic slides in biology, physiology, and pathology has the lantern been of inestimable service. The earliest means of optical projection was the magic lantern, said to have been invented in the first half of the 17th century.

#### **Optic Nerve. Sec Eye.**

**Optics**, the science which treats of the properties of light, more especially in connection with vision. The rays that enter the eye may have come directly from the object in straight lines through one medium, or they may have reached the eye after various reflections and refractions at surfaces separating different media. One branch is *Geometrical Optics*, in which the properties of mirrors and lenses are deduced geometrically from the few fundamental principles. Another branch is *Physiological Optics* which includes the eye as an optical instrument, its anatomy in relation to its functioning as an organ of vision, the defects of eyesight, the subjective effects of color. Again, under the title of *Meteorological optics*, there is to be discussed a great variety of natural phenomena, such as the blue color of the sky, and the apparent flattened dome form of the vault of heaven, and the twinkling of the stars.

**Optimism** (Latin *optimus*, 'best'), the doctrine that the existing order of things, whatever may be its seeming imperfections of detail, is nevertheless, as a whole, the best which could have been created. The philosophical discussions of which this controversy is the development are as old as philosophy itself. But the full development of the optimistic theory as a philosophical system was reserved for Leibniz, in his *Theodicæe*, which was designed to meet the sceptical theories of Bayle. Its theories were ridiculed in Voltaire's *Candide*.

**Optometry**, as defined in the various statutory laws regulating its practice, is 'the employment of any means, other than the use of drugs, for the measurement of the powers of human vision and the adaptation of lenses for the aid thereof.' The term *optometrist* means literally 'eye-measurer,' and the prac-

tice consists not only in testing the ability to read graduated letters on a chart or a card, and trying the effect of various lenses to improve the sight, but in determining the visual state by means of various objective examinations and measurements. Among the instruments and devices employed are the ophthalmoscope, ophthalmometer, skiascope, phorometer, trial case of assorted lenses, and 'astigmatic' and graduated letter or symbol reading charts, for both distant and near vision. Every State has an association of optometrists whose members have, through affiliation, membership in the American Optical Association. The National Organization of State Board Examiners in Optometry strives to standardize optometrical education in the U. S.

**Opus Operatum** (Lat., literally 'the work wrought'), the phrase employed in theological schools to describe the manner of operation of the sacramental rites.

**Oracles** were in ancient times held to be the means of the revelation of the divine purpose, and thus of future events, to men. The Delphic oracle was much the most famous of the ancient oracles. Within the temple of Apollo at Delphi there was a small aperture in the floor, directly above the stream of the Cassotis, from which vapors arose. A tripod was placed above this, and on it the prophethess (called the Pythia) took her seat. As the vapors arose from the cleft she became intoxicated, and in her frenzy gave utterance to the oracle, which the attendant priest took down and handed to a poet, who reduced it to a regular if somewhat enigmatical expression in hexameter verses.

**Oran**, fortified seaport, and Episcopal see, Algeria. Oran has a good harbor, one of the busiest on the Mediterranean; exports include esparto grass, iron ore, grain, wool, hides, and wine, most of the trade being with the Spanish coast; p. 150,300.

**Orang**, (*Simia*), an anthropoid ape which is peculiar to the islands of Borneo and Sumatra. There is probably only one species, *S. satyrus*, often called the orang-utan, which signifies in Malay the 'man of the woods.' The orang differs much in appearance from its allies, the gorilla and chimpanzee, and is lower in order than these two. It has enormously long arms, which reach to the ankle when the animal stands upright, and short, thick, twisted legs, with a very feebly developed calf, and narrow flat heels. The hair is very long, and is reddish in color.

**Orange**, the fruit of a small evergreen tree belonging to the family Rutaceæ. It is a native of Asia, either China or India. The

tree grows to the height of about 30 ft., and has glossy oval leaves, fragrant white blossoms, and round deep yellow fruit, divided into segments, with a somewhat oily rind and juicy acid pulp. There are two main species, the Sweet Orange (*Citrus sinensis*), which includes most of the oranges of commerce, and the Bitter or Seville Orange (*C. aurantium*), valued for the oil obtained from its peel, and for making marmalades. Other species are *C. nobilis*, to which belong the tangerines, mandarins and satsumas, and *C. japonica*, known also as the Kumquat, bearing small, round or oblong fruit about an inch in diameter.

It is a residential city, a suburb of New York and Newark, and a flourishing manufacturing centre. Orange is located near the base of Orange Mountain (a basaltic ridge rising more than 600 ft. above the sea), at an elevation of 150 to 200 ft. Places of scenic interest in the vicinity are Hemlock Falls (South Orange); Llewellyn Park, a beautiful residential tract of about 750 acres, held in common, under certain restrictions, by those living in it; Eagle Rock, commanding a magnificent view; and Orange Park, a part of the Essex County Park system. Adjoining Llewellyn Park is the Edison Laboratory. Important manufactures



Photo Brown Bros., N. Y.

Orange Grove.

Oranges are grown in all parts of the subtropical and warmer temperate portions of the world. In the United States the principal orange-growing States are Florida and California. Oranges are susceptible to cold, and are in danger as soon as the temperature drops below freezing, although they can often withstand a light frost. Oranges form an exceedingly important and valuable crop. They are used as a dessert fruit and for making marmalades and preserves, and the juice is increasingly used dietetically. The oil obtained from the rind of the better varieties is used in the manufacture of perfumes.

**Orange**, city, New Jersey, Essex co., 4 m. n.w. of Newark, 11 m. w. of New York City, and adjoining East Orange and South Orange.

include hats, boxes, planing-mill products, electrical supplies, and Edison phonographs; p. 35,717.

**Orange Free State**, province of the Union of South Africa, separated from the Cape of Good Hope, to the s. and w., by the Orange River. The area is 50,389 sq. m. The mean elevation is about 5,000 ft., which makes the climate in general dry and healthful, though cold in winter and subject to long drouths, broken by violent thunderstorms in summer.

The population of the province of Orange Free State is about 700,000 white, and 40,271 colored. The capital is Bloemfontein. Education has been free since 1904 and is compulsory in the early grades. Both English and Dutch are used in the schools and in the courts.

**Orangemen**, an association of Protestants to defend the Protestant succession to the British throne and the Protestant religion in church and state as settled by the Bill of Rights and Act of Settlement of 1688. It had its origin in William, Prince of Orange, on his arrival in England, but was not definitely established in Ulster till 1795.

**Orange River, Gariep, or Groote River**, the longest river of South Africa, 1,300 m., though practically useless for navigation, because of the bar at its mouth and rapids some 20 m. farther up.

**Oratorio**, a musical drama of a sacred or semi-sacred nature, requiring for its adequate performance a large body of singers, with a full orchestral accompaniment, which is also frequently supplemented by a part for the organ. Its origin may be traced back to the miracle plays of the 13th and 14th centuries. During the 18th century, the most prolific and in some respects the greatest of all composers of oratorio was Handel whose most famous oratorio, the *Messiah* (1741) was written in twenty-four days. The oratorios which perhaps most seriously rival those of Handel as regards frequency of performance and degree of popularity are Haydn's *Creation* (1798) and *Seasons* (1801), and Mendelssohn's *St. Paul* (1836) and *Elijah* (1846).

The term oratorio is applied also to almost any choral-orchestral work in which the music is in the style of an oratorio, and the subject treated is of a serious nature. The modern requiem mass may be regarded as a form of oratorio. Consult G. P. Upton's *The Standard Oratorios*.

**Oratory, Congregation of the**, religious associations founded early in the 17th century, one of which became celebrated in England and the other in France.

**Orbit**, the path pursued by one heavenly body about another under the influence of its attraction. The orbits traced by the planets and satellites of the solar system are ellipses one focus of which is occupied by the governing mass.

**Orcagna**, the common designation of ANDREA DI CIONE (c. 1308-c. 1368), Florentine painter and sculptor, who for some time after the death of Giotto was one of the leading artists in Florence. His chief paintings are frescoes in the chapel of Santa Maria Novella, Florence. His *St. Zenobius Enthroned* is also at Florence, and an altar-piece, the *Crowning of the Virgin*, is now in the National Gallery, London.

**Orchardson, Sir William Quiller** (1835-

1910), Scottish genre painter, born in Edinburgh. His pictures include *Napoleon on the Bellerophon* (1880), *The Challenge* (1865), *In the Gloaming* (1901).

**Orchestra**. A body of performers on any kind of musical instrument may be termed a *band*, but the title *orchestra* implies that stringed instruments played with the bow constitute an essential feature of the combination. The use of orchestral accompaniment to dramatic music was introduced in Italy and France about the beginning of the 17th century, during which period Monteverde of Mantua is believed to have done most to further its development. In his opera, *Orfeo* (1608), he employed an orchestra of thirty-six instruments, consisting of harpsichords, violins, viols, lutes, guitars, organs of wood, trumpets, flutes, and other instruments. Orchestral music gradually developed into a separate branch of art, which has become perhaps the greatest of all forms of musical compositions. An example of a well-arranged orchestra contains fourteen first violins, twelve second violins, ten violas, eight violoncellos, eight double-basses, one harp, three flutes, one piccolo, three oboes, one cor anglais, three clarinets, one bass clarinet, three bassoons, one contra fagotto, four horns, four trumpets and cornets, three trombones, one bass tuba, three kettledrums (tympani), one side drum, one bass drum, one triangle, and one pair of cymbals. The manner in which the tones of the different instruments are blended or contrasted in an orchestral composition is termed orchestration or instrumentation. Orchestral music, apart from its use in conjunction with works of a dramatic nature did not receive serious attention until about the beginning of the 18th century. Among the names of those most intimately associated with its development are Bach, Gluck, Haydn, Mozart, Beethoven, Schubert, Schumann, Mendelssohn, Berlioz, Wagner, Brahms, Tchaikowsky, Dvorák, and Richard Strauss. Outstanding in the United States are the New York Philharmonic Symphony Orchestra, conducted by Arturo Toscanini and various guest conductors; the Boston Symphony Orchestra, Serge Koussevitzsky, conductor since 1924; the Philadelphia Symphony Orchestra, conducted by Leopold Stokowski from 1912-35, when he retired.

**Orchids**, perennial herbaceous plants, with fleshy or leathery parallel-veined leaves, and remarkable flowers of every size and color, with three sepals, and three petals, of which the lower one is usually larger, wider, and more brightly colored than the others, and is known

as the labellum. The pollen is often raised in masses, or pollinia, on little stalks.

**Orchomenus**, city in Boeotia in ancient Greece. It was destroyed by the Thebans in 364 B.C., but was restored by Philip of Macedon in 338 B.C.

**Orcin**, or **Orcinol**, is 1.3.5 dihydroxytoluene,  $C_6H_3CH_3(OH)_3$ , occurring in lichens of the species *Rocella* and *Lecanora*.

**Ordeal**, a term applied to certain archaic methods of obtaining, as was believed, the Divine judgment in doubtful cases by means of various physical tests. In the ordeal of *bier-right*, exemplified in Scott's *Fair Maid of Perth*, the belief acted upon was that the corpse of a murdered man would bleed at the touch of his murderer. In the ordeal by *fire* the accused had to carry a red-hot bar of iron nine yards from the fire, or to put on a pair of red-hot steel gloves, or to walk, barefoot and blindfold, along a path strewn with red-hot ploughshares. Innocence or guilt was otherwise decided by *wager of battle*, a champion being selected to meet the accused, who, if defeated, was of course guilty. Ordeal by *swimming* was commonly practised in dealing with women accused of witchcraft. Suspected witches were tied hand and foot and thrown into a lake or stream. If they floated, they were proved witches, and they were accordingly taken out and executed. If they sank, and were (incidentally) drowned, they were innocent.

**Order**, in natural science, a grade in classification inferior to class and sub-class, and embracing a group of related families. In botany the term has a somewhat different value in classification; and it is customary to employ the term 'natural order,' the adjective being, a heritage from the days when the classification of the flowering plants was based on professedly artificial distinctions.

**Orderly**, in the U. S. Army, usually refers to a private soldier selected by the Post Adjutant at guard mounting from among the men marching on guard that day to carry orders for the commanding officer for the next twenty-four hours. Each barrack room has an orderly detailed for the day to see that the room is kept in order.

**Orders, Army**. In the U. S. army orders are classified as *General* and *Special*. General orders publish matters of interest to the entire command, and special orders those concerning individuals or matters which need not be made known to the whole command. Orders and circulars are published on matters within their several jurisdictions by all headquarters from

that of the commander-in-chief down to the commander of a detachment, and each class is numbered in a separate series for each calendar year.

**Orders, Holy**, are the various grades of the clerical office. In the Roman Catholic Church they are priest, deacon, and sub-deacon (major orders, and acolyte, reader, exorcist, and door-keeper (minor orders). In the Eastern churches the last four are included in the single office of anagnost or reader. In the Church of England there are three degrees of holy orders—bishops, priests, and deacons. Ordination is by laying on of hands by a bishop, but it is not a sacrament in the English Church as it is in the Church of Rome.

**Orders of Knighthood**. Knight is derived from the Anglo-Saxon *cniht*, 'a youth'—a term which early became restricted to the attendants of an earl or prince, and, later, limited to a special military class distinguished by descent or special valor, which held lands by tenure of its knighthood. The first chivalrous orders were military, and were instituted in order that certain picked knights, living under a religious rule, should be available to assist Christian pilgrims, to defend or recover the holy cities from the Saracens, and to lead crusades against the Moslems in Spain or the heathen (Slavs) in Eastern Europe. Of these the chief orders were the Knights of St. John, Hospitallers, the Templars. After chivalry as an institution fell with new modes of warfare, orders of knighthood still continued as a special distinction. There is hardly any old kingdom that boasts no order of knighthood, but the United States of America has none. The Congressional Medal of Honor and the Distinguished Service Cross are conferred in the U. S. as rewards of merit. In Asia there are some orders: Persia has the Sun and Lion (1808); Siam, the White Elephant (1861); China, the Double Dragon (1862; remodelled 1882); and Japan, the Eastern Sun (1875) and the Chrysanthemum (1876).

The orders of knighthood in Great Britain are the Order of the Garter; Order of the Thistle; Order of St. Patrick; Order of the Bath; Order of the Star of India; Order of St. Michael and St. George; Order of the Crown of India; Order of the Indian Empire; Order of Victoria and Albert; Royal Victorian Order. The legion of Honor in France is a well known order of knighthood.

**Ordinate** is the name originally given to what is now more usually called the *y* co-ordinate in the Cartesian system of co-ordinates, the *x* co-ordinate being named the abscissa

**Ordination**, the ecclesiastical act by which one is set apart for the ministry of the church. In the Presbyterian churches the power of ordination rests with the presbytery, which appoints one or more of its number to perform the service, which includes the laying on of hands.

**Ordnance Department**, that division of the United States army which 'is charged with the duty of procuring by purchase or manufacture, and distributing the necessary ordnance and ordnance stores required for use by the Army of the United States, including the National Guard and Organized Reserves. The Department maintains arsenals for the manufacture and depots for the storage of the supplies, as well as proving grounds for testing all supplies purchased or manufactured, and for the testing of new inventions and improvements.

**Ordovices**, the Latin name of an ancient British tribe who dwelt in the northwestern part of modern Wales.

**Ordovician**, a geological system between the Cambrian and the Silurian. The lowest subdivision in the original area is the Arenig, the middle the Llandeilo, and the uppermost the Bala or Caradoc. They consist of grits or greywackes, with some conglomerates, shales, and two well-marked limestones, of which the best known is that of Bala. Volcanic activity prevailed, especially in Arenig and Bala times, and great sheets of ashes and masses of lava are intercalated with the sedimentary rocks.

The North American Ordovician is extensively developed, the type section being found in New York State. Its subdivisions for the Eastern United States are:

The American Ordovician contains iron ores, lead in the upper Mississippi Valley, manganese in Arkansas, and phosphates in Tennessee; while from the Trenton limestone and associated strata, supplies of natural oil and gas have been obtained in remarkable abundance. Building stone is extracted from several of the limestone members, and sand for glass making comes from the St. Peter sandstone.

**Ore.** See **Ores**.

**Örebro**, town, Örebro province, Sweden. The town was formerly the meeting place of the Diet, which in 1529 decreed the establishment of Lutheranism as the state religion. Sweden's shoe industry has its centre here and there is trade in mining products; p. 37,968; of the province, 218,598.

**Oregon** (probably from the Spanish *Oregones*, meaning 'big-eared men,' applied by Jesuits to native Indians; popularly known as

the 'Web-Foot State', one of the Western States of the United States. With extreme dimensions of 375 m. (e. to w.) and 290 m., it has a total area of 96,699 sq. m., of which 1,092 are water.

Oregon is divided into two dissimilar sections by the Cascade Mountains, which cross the State from n. to s. 120 m. from the coast. The elevation of this range is from 4,000 to 10,000 ft., several peaks rising to the level of perpetual snow. Mount Hood, an extinct volcano in the n., reaches an altitude of 11,225 ft. Between the Cascade and Coast Ranges lie the three important valleys of the State—the Willamette, the Umpqua, and the Rogue River valleys.

The Columbia River forms the northern boundary of Oregon for 300 m. In the south central portion of the State are a number of lakes, including Upper and Lower Klamath, Goose, Harney, Malheur, and Crater Lake, the last one of the most remarkable scenic features of America. Owing to the influence of the Japan current and the prevailing southwest winds, the climate of Western Oregon is milder than that of Eastern States in the same latitude.

Oregon has immense lumber resources, comprising approximately one-fifth of all timber in the United States. Douglas fir makes up more than 50 per cent. of the total stand on the coast. This and the western yellow pine also found here are used in interior finish. The cut of timber is the second in the United States, Washington being first. The fruit industry is one of the most important in the country. The Oregon apples are known all over the world; other fruits grown are peaches, pears, plums, prunes, etc. The annual wheat harvest averages 23,567,000 bushels from 1,088,000 acres. All of the basic minerals are in Oregon, although they are undeveloped as yet. The gold production in 1940 was estimated at \$3,000,000. The State is one of the foremost in the value of salmon fisheries. The Astoria fisheries, at the mouth of the Columbia, are among the world's greatest. Grazing is carried on chiefly in the eastern part of the State. Portland is the leading livestock market and packing center of the Pacific coast.

The University of Oregon is situated at Eugene, and the Oregon Agricultural College, at Corvallis.

The present constitution of Oregon is that adopted in 1857, preliminary to admission as a State, with subsequent amendments. Under the Reapportionment Act, Oregon has 4 Representatives in the National Congress.

Salem is the State capital. Oregon began the national movement for direct primaries, the initiative and referendum, and the recall; p. 1,089,684.

The earliest explorations along the coast of Oregon were those of the Spaniard Ferrello in 1543, who probably reached a point as far n. as latitude 42°, and of Sir Francis Drake in 1579, who touched the coast at a point one degree farther n. In 1778 Captain Cook touched the coast at Nootka Sound. In 1804-6 Lewis and Clark, sent out by the United States Government, explored the country from St. Louis to the mouth of the Columbia. Their route followed the path of the Oregon Trail, about 2,000 m. in length, from Independence, Mo., to the Columbia River. An Oregon Trail Celebration was held in 1930. In 1811 the Pacific Fur Company founded a post at the mouth of the Columbia, which was named Astoria, after John Jacob Astor, president of the concern. By the convention of 1818 between the United States and Great Britain, the territory w. of the Rocky Mountains was to be left open to traders and settlers of both countries for ten years. In 1827 the agreement for joint occupancy was indefinitely continued. The first agricultural settlement was founded by retired trappers and servants of the British company about 1829. In 1834 Jason Lee founded the Methodist Mission in the Willamette Valley. The conflicting interests of the British traders and the American settlers, aggravated the Oregon Question which threatened to involve the United States and Great Britain in serious difficulties. The dispute was settled, however, by a joint commission (1846), and a treaty stipulated that the forty-ninth parallel from the Rocky Mountains to Fuca Strait should constitute the boundary between the British and American possessions in the Northwest. Oregon was made a Territory on Aug. 12, 1848, and Joseph Lane, the first territorial governor, arrived in March, 1849. Oregon was admitted into the Union on Feb. 14, 1859.

Since the early forties, Oregon has been frequently troubled by Indian uprisings, the most serious being the conflicts with the Shoshones and the Modocs. From June to October, 1905, the Lewis and Clark Exposition was held in Portland, Oregon. The great Columbia highway, unexcelled for scenic beauty, Mt. Hood, Crater Lake, and the Bonneville Dam are points of tourist interest.

**Oregon City**, city, Oregon. It is a manufacturing center, producing woolen goods, soap, flour, paper and pulp, and lumber, enormous

water power of the Willamette Falls being utilized in the various industries; p. 6,124.

**Oregon Question**, the dispute between the United States and Great Britain (1818-46) concerning the boundary between British and American territory on the Pacific Coast. See NORTHWEST BOUNDARY DISPUTE.

**O'Reilly, John Boyle** (1844-90), Irish-American poet and journalist, was born in County Meath, Ireland. He settled in Boston, Mass., as editor of the *Pilot*, an Irish-American newspaper. He reported the Fenian raid on Canada (1870), and in 1876 managed the clandestine transference of his convict associates from West Australia to the United States. In 1889 he was selected to deliver the poem on the occasion of the dedication of the monument to the Pilgrim Fathers at Plymouth, Mass. A statue of O'Reilly by Daniel Chester French was unveiled at Boston in 1896. Among other works his novel *Moondyne* was well received.

**Orel**, town, U. S. S. R., a center for the grain trade. It has commerce in wood, hemp, silk, dairy products, cattle, and leather; p. 110,567. Held by the Nazis in World War II.

**Orellana, Francisco de** (c. 1490-c. 1546), Spanish explorer, was born in Trujillo, Spain. In 1540 he accompanied Gonzalo Pizarro in his expedition from Quito across the Eastern Andes in search of treasure. Arriving at the Napo, Orellana was sent down that river with sixty men to search for provisions; but, abandoning his commander, he did not return, and continued down the Marañon and Amazon to the Atlantic, after a heroic struggle against the climate and the native tribes. An account of his expedition, in which was described a race of female warriors, led to the name Amazon being given to the river.

**Orenburg**, town, U. S. S. R. Three miles s. of the town, on the Ural, is the exchange, built like a citadel, where traders from European Russia meet with native merchants of the steppes and other regions. The extension of the Moscow-Samara Railway to Tashkend was completed in 1904. In 1773-4 Orenburg was besieged for six months by the rebel Cossacks under Pugachev; p. 122,000.

**Ores**, those mineral compounds occurring in nature from which metals may be extracted in commercially profitable quantities. They are rarely pure, but are usually mixed with more or less earthy or rock material (gangue), in which or with which they have been deposited. Ores are found in the rocks of every geologic age, but most frequently in the older



formations, and where the sedimentary rocks join those of igneous origin.

With the exception of the ores of iron and manganese, which occur usually in stratified beds, the greater proportion of metalliferous deposits, including galena, pyrites, blende, tinstone, and the cobalt and zinc ores, are of the nature of veins. In addition to mineral 'lodes' or veins, the metalliferous materials may be disseminated more or less regularly through the whole body of the rock, as in the celebrated blanket reefs of the Transvaal. Igneous rocks also—such as granite, diabase, and dolerite—may carry ores of gold, platinum, copper, nickel, etc., disseminated throughout their mass.

**Orestes**, in ancient Greek legend, the son of Agamemnon and Clytæmnestra. The story of Orestes is told in the *Choëphoræ* and *Eumenides* of Æschylus, the *Electra* of Sophocles, the *Electra*, *Orestes*, and *Iphigenia in Tauris* of Euripides.

**Organ**, a musical instrument of great antiquity. The primitive form was a set of reed pipes of graduated lengths. The hydraulic organ, in which pressure on the bellows was supplied by water, is supposed to have been invented by Ctesibius in the second or third century before Christ; and it was in use, together with the pneumatic type, throughout ancient times, and occasionally until the 14th century. Before the middle of the 5th century the organ is said to have been introduced into the churches of Spain and England; and during the latter half of the 7th century, into the Church of Rome by Pope Vitalian.

The most characteristic features of the modern organ first appear about the middle of the 19th century. Previous to that, Bishop had invented composition pedals for controlling the stops; Barker, the pneumatic lever for lightening the 'touch'; Cavallé-Coll, the harmonic system of flue-pipe voicing; and Hill, the tuba mirabilis, a powerful harmonic reed stop voiced on heavy wind pressure. It is, however, primarily to Henry Willis that we owe that renaissance of organ building which has taken place in English speaking countries.

Gern and Willis were the pioneers of the early form of tubular pneumatic action, and electro-pneumatic action was introduced by Bryceson in the early sixties. Little practical use was made of it till 1886, when Willis employed it successfully at Canterbury Cathedral, while Lewis Hill and others adopted it to a limited extent. About 1890 Hope Jones reintroduced it in a somewhat novel form, and

his system has been simplified and extensively used up to the present time. Adjustable pistons, invented by Roosevelt in 1886, marked an important advance in the principle of organ control. In present-day organs the action is usually electro-pneumatic and stops can be played simultaneously, in series. By the 'double touch,' notes can be emphasized without raising the hand from the keyboard.

**Organic Chemistry**, a branch of chemistry in which are considered the compounds of carbon. See CHEMISTRY.

**Organic Rocks**, a group of rocks of organic origin for which the term *biogenic* has been proposed by A. W. Grabau. They are both of plant and animal origin, and include *shell limestone*, *chalk*, *marl*, *siliceous sinter*, *peat*, *coal*, *diatomaceous earth*, etc. See ROCKS.

**Organism**. See BIOLOGY.

**Organisms**, characteristics of a living animal or plant. See BIOLOGY.

**Oribasius** (c. 326-403), Greek physician. He compiled *Synagoge Iatricæ* from Galen and others, and was the first to describe the salivary glands.

**Oriel**, an antechamber, penthouse, porch, gatehouse, or lofty gallery for minstrels, dating from the 13th century. Built over gateways for defensive purposes, it became characteristic of Tudor domestic and collegiate Gothic architecture. A bay window is an oriel window on the ground floor.

**Orientation**, the turning toward the East, or Orient; the position of worshippers facing toward the East, or in Christian worship toward the eastern end of the church; also the position in which a corpse is laid in the ground, with the head to the w. and the feet to the e. The practice of orientation is of prehistoric antiquity, and no doubt arose from pagan worship of the rising sun.

**Origen**, surnamed *Adamantius* (c. 185-254), one of the greatest of the early church fathers, was born probably in Alexandria. A keen student of Greek philosophy, he applied himself also to Scriptural exegesis, in which he excelled as a teacher. About 230 he settled at Cæsarea, where he taught philosophy and theology for the next twenty years. He was imprisoned and tortured during the Decian persecution (250).

The most important of his writings that survive are the *Peri Archon*, the first attempt at scientific Christian dogmatics; a few *Homilies*; parts of *Commentaries* on Matthew, John, and Romans; the great apologetic treatise *Against Celsus*; parts of the monumental

*Hexapla*, in which he laid the foundation in the textual criticism of the sacred writings (edited by Field).

Origen's theological system is a philosophy of revelation based on the principle that all elements of truth in Greek metaphysics are embraced and completed in Scripture, which, as the sole source of Christian dogma, admits of a threefold interpretation (literal, moral, and spiritual), corresponding to the tripartite nature of man.

**Original Sin**, a theological term, applied to the radical corruption of human nature, by reason of which man is in himself incapable of, and disinclined to, moral good, this original taint being inherited from Adam as a result of his fall.

**Orinoco**, river, South America, rises on Pic Ferdinand de Lesseps in Sierra Parima, which separates Venezuela from Brazil, and pursues a n. and e. course through Venezuela for 1,570 m. Its basin measures 370,000 sq. m. In 1930, the Museum of the American Indian sponsored an expedition to the source of the Orinoco. Previous to this expedition, no one, during the past 400 years, had traced the Orinoco to its headwaters.

**Oriole**. In North America this name is given to the series of beautiful and familiar song birds of the family Icteridae, related to the blackbirds, which are distinguished for their habit of building pouch-shaped, pensile nests of hamper fibres, grass, and similar flexible materials. The best known and most widely distributed is the Baltimore oriole, the male of which is bright orange yellow with black wings and tail.

**Orion**, an ancient constellation supposed to represent Orion clad in a lion skin for the chase, wearing a belt and carrying a club and sword. It comprises three splendid stars—Rigel, Betelgeux, and Bellatrix.

**Orion**, in ancient Greek legend, a giant and a mighty hunter. Upon his death he was placed in the heavens as a constellation.

**Orissa**, an ancient kingdom of India, the authentic history of which goes back for probably more than a thousand years, extended from Bengal on the n. to Godavari on the s. The province which now bears the name forms the extreme s.w. portion of Bengal, and consists of a low fertile coast plain traversed by the Mahanadi, Brahmani, and Baitarani.

**Orizaba**, city, state of Vera Cruz, Mexico. It is a favorite resort for Mexicans and travelers because of its fine, though tropic, climate and beautiful scenery. It lies in a broad valley

at an elevation of 4,025 ft., and is partly surrounded by high mountains, including the splendid Peak of Orizaba. It is one of the oldest towns in America, and in 1457 was taken by Montezuma I. It was formerly the capital, and was occupied by the French in 1862; p. 39,563.

**Orizaba, Peak of**, or **Citlaltepetl** (the 'Star Mountain'), a dormant or extinct volcanic mountain of Mexico. It is the loftiest summit in the republic, and the next to the highest mountain in North America, its elevation of 18,200 ft. being surpassed only by that of Mt. McKinley in Alaska.

**Orkney Islands**, a group of islands off the n. coast of Scotland, separated from the mainland by the Pentland Firth. They number nearly seventy, of which about thirty are inhabited. The total area is 376 sq. m. The largest, Pomona or Mainland, contains Kirkwall, the capital, and Stromness, the only towns in the group. Amongst the numerous archaeological remains, the most noticeable are the standing-stones of Stennis and the cairn of Maeshowe; p. 22,075.

**Orlando**, city, Florida. The city is best known for its fruit-growing industry and as a tourist resort; p. 36,736.

**Orlando, Vittorio Emanuele**, (1860), Italian diplomat, was born in Palermo. When the Boselli government fell, owing to the second Austrian invasion of Italy during the Great War of Europe, Orlando succeeded to the premiership (Oct. 30, 1917). He represented Italy at the Peace Conference (1919). Orlando was one of the few non-Fascists to serve as deputy under Mussolini.

**Orleans**, chief town and capital of the department of Loire, France. Interesting features of the city are the Cathedral, destroyed by the Huguenots in 1567 and rebuilt from 1601 onwards; the Hôtel-de-Ville (1530); the museum (15th century) and the houses of Joan of Arc and Agnes Sorel. Being on the high-road to Paris, and on the navigable Loire, Orleans is a place of commercial importance.

The Celtic Genabum, Orleans was renamed by the Romans (c. 272) Civitas Aureliani. Attila besieged it (451); the Northmen sacked it twice (855 and 865); and the raising of the English siege of 1429 shed luster on the name of Joan of Arc, the Maid of Orleans. In the Franco-German war it was occupied by the invaders, Oct. 11 to Nov. 9, 1870, and again in December; p. 72,069.

**Orleans**, island, Montgomery co., Quebec, in the St. Lawrence River. It is very popular

as a summer resort. In 1759, prior to the siege of Quebec, General Wolfe camped here with his forces; p. 5,000.

**Orleans, Duke of**, a title borne by three separate lines of French princes of royal blood. The first Duke of Orleans was PHILIP, son of King Philip VI. (1344). JEAN BAPTISTE GASTON (1608-60), a son of Henry IV., received the title (1626) from his brother, Louis XIII. The power bestowed upon him during the minority of Louis XIV. was counteracted by Mazarin. He then joined the Fronde, and was ultimately banished to Blois, where he ended his life. PHILIPPE (1674-1723) exercised the regency during the minority of Louis xv. It was during his regency that the 'Mississippi Scheme,' formed for the purpose of paying off the national debt of France, caused the financial panic of 1720. LOUIS PHILIPPE JOSEPH (1747-93) made himself popular in France by his liberalism, advocating the cause of the colonies in the American Revolutionary War. It was he who headed the seceding noblemen who joined the *tiers état* in the States-general in June, 1789.

**Orleans, Maid of**. See Joan of Arc.

**Orloff, or Orlov, Alexis, Count** (c. 1736-1808), Russian admiral. In 1762 he was one of the leaders of the revolution which placed Catherine on the throne, when he strangled Peter III. with his own hands.

**Ormolu**, a kind of brass made of equal parts of copper and zinc.

**Ormond, resort, Fla.** The broad ocean beach, 30 m. long, is a favorite course for automobile racing. In the vicinity are the remains of a 16th century Spanish mill; p. 1,914.

**Ormonde, James Butler, twelfth Earl and first Duke of** (1610-88), Irish administrator, was born at Clerkenwell, London. From the outbreak of the Irish rebellion in 1641 to Cromwell's campaign in 1649 he was the ruling spirit in Ireland. Three times, he was made governor of Ireland.

**Ormonde, James Butler, second Duke of** (1665-1745), British soldier and statesman, born in Dublin Castle. He was engaged in the war with Spain, became governor of Ireland, and superseded Marlborough in Flanders. On the accession of James II. he fled to France, but he played a prominent part in the rising of 1715.

**Ormuz**, formerly one of the wealthiest commercial cities of the East. In the 13th century, it was the headquarters of the Persian trade with India. The town is now a ruin.

**Ornamental Stones**. To be employed for decorative purposes a rock must have a pleasing color, and be susceptible of a high

polish. Marble and alabaster are often white, but most ornamental stones are colored, and many are spotted, veined, banded, or variegated. Hardness, though valuable, is not essential, and greatly increases the cost of working. The softer stones, such as gypsum, alabaster, and marble, are preferably confined to interior work; while granite syenite, and porphyry are more applicable to façades and exteriors. Those stones which can be obtained in large blocks are most generally used for architectural purposes. Jasper, onyx, agate, and black slate also serve as decorative stones.

**Orne**, dep., n.w. France. Its horses are famous. Dairy produce is exported. It manufactures lace, cotton, and linen goods. Alençon is the capital; p. 277,637.

**Ornithologists Union, American**, an association formed in 1883 and incorporated in 1888, for the advancement of its members in ornithological science. The union meets in November of each year and publishes the *Auk*, a quarterly record of ornithology, and the *Check-list of American Birds*.

**Ornithology**. See Birds.

**Ornithorhynchus**, a curious mammal, called the duck-mole, duck-billed platypus, or duck-bill. There is only one species, *O. anatinus*, confined to s. and e. Australia, New Guinea



*Ornithorhynchus*, or Duck-bill.

and Tasmania. The animals are aquatic in their habits, inhabit rivers, and dwell in long burrows in the banks of the creeks which they haunt. The extraordinary fact that the animals—though true mammals—lay eggs determines their inclusion, together with Echidna, in the sub-class Monotremata or Prototheria. The adult male reaches a total length of about twenty inches. There is no visible external ear; the eyes are small; the muzzle is flat and broad, and is covered by a dark-colored beak, which is hairless, and closely resembles the bill of the duck.

**Orono**, town, Me. The University of Maine and the State Experiment Station are situated here; p. 3,702.

**Oropus**, an ancient Greek town on the borders of Attica and Boeotia. The Athenians and

Boeotians constantly contended for its possession from the 6th century B.C. to 338 B.C., when the former secured it permanently.

**Orpheus**, in ancient Greek legend, a son of the muse Calliope, was regarded as the most famous of the poets who lived before Homer. He came from Thrace, and accompanied the Argonautic expedition. Apollo gave him a lyre, and the Muses taught him its use, so that he charmed not only wild beasts, but even the trees and stones of Olympus.

**Orpiment**, arsenic trisulphide,  $As_2S_3$ , is found in nature in Hungary and the Harz Mts., sometimes crystallized. It is usually, however, prepared artificially by precipitating a solution of arsenious oxide in hydrochloric acid by hydrogen sulphide; or better, by subliming arsenious oxide with sulphur.

**Orr, Alexander Ector** (1831-1914), American merchant, was born in Ireland and settled in New York City in 1851. On the Rapid Transit Commission he did much to bring about a feasible scheme of underground transit for New York City. For many years he was prominent in philanthropic and charitable movements in New York City and Brooklyn.

**Orrery**, a machine for demonstrating the motions of the solar system, was probably invented by George Graham (1675-1751). An offspring of the orrery is the modern 'Planetarium,' a German invention of the optician Zeiss. The first in America was built (1929-30) on an island in Lake Michigan, off Chicago. This instrument now is regarded as a mere toy.

**Orrery, Roger Boyle, Baron Broghill and First Earl of** (1621-79), British statesman and dramatist; served with the royalists in Ireland in the Civil War; afterwards assisted Cromwell in reducing Ireland. He was a member of Cromwell's House of Lords (1657), and one of the committee that recommended Cromwell to assume the title of king. **CHARLES BOYLE, FOURTH EARL OF** (1676-1731), has been immortalized in Swift's mock-heroic *Battle of the Books* (1695-8). He is chiefly noted for his part in a literary dispute with Bentley, who completely crushed him by his *Dissertation on the Epistles of Phalaris* (1697). **JOHN BOYLE, FIFTH EARL OF** (1707-62), the friend of Pope, Swift, and Dr. Johnson. His *Remarks on Swift*, disfigured by malice, is the first contemporary account of that writer (1751).

**Orris Root**, the roots of *Iris florentina*, *I. pallida* and *I. germanica*, principally of the first, used as a perfume. Orris is used chiefly to scent dentifrices and other toilet powders, its fragrance being violet-like.

**Orthoclase** is potash feldspar, often containing a considerable percentage of soda. It is the characteristic feldspar of granite and quartz porphyry, in which it sometimes occurs in individuals several inches in diameter.

**Orthodoxy**, soundness of belief, especially in religious doctrine. It implies the existence of the standard of theological truth, which is supposed to be found in the general consensus of Scripture and ecclesiastical tradition. But the theological standing of an individual is judged of an orthodox (or heterodox) not so much by appeal to any general or universal creed, as rather by reference to the particular formularies of his own church. Hence the heterodoxy of one age may become the orthodoxy of a later. The Greek Church calls itself the Holy Orthodox Church.

**Orthography**. Orthography is properly the art of writing words according to the conventionally correct spelling. The practical considerations affecting the decision as to what is orthographically a correct spelling have largely to do with the question of convenience and general utility. The great majority of English words are now invariably spelled in one way, as given in the dictionaries, by educated people, and for these words that spelling is, in the present state of our language, the one orthographically correct.

**Ortler Group**, of Alps, between Adda, Adige, and Oglio valleys, includes the glaciated Ortler group proper, with the Ortler (12,802 ft., the highest summit in the e. Alps), Königspitze, 12,655 ft., Monte Cevedale, 12,382 ft.

**Ortolan**, a term often used by writers to describe some indefinite small bird highly esteemed as a table delicacy; and sometimes more definitely applied to the American reed-bird, or bobolink.

**Orton, Edward** (1829-99), American geologist, born in Deposit, N. Y. In 1869-75 he was assistant state geologist of Ohio, being meanwhile President of Antioch College, O. (1872-73), and the first president of the Ohio Agricultural and Mechanical College (afterward the Ohio State University) in 1873-81. He was state geologist of Ohio in 1882-99. He was an expert on the geology of oil and gas regions.

**Orvieto**, walled tn. Perugia prov., Italy, 26 m. n. of Viterbo. It is reached by a funicular railway, and occupies the site of the Etruscan city of Volsinii. Its cathedral, which dates from the 13th century, is one of the finest Gothic structures in Italy. The Palazzo Solfiano is another noted building; p. 18,208.

**O. S.**, Old style, in the calendar.

**Osage Orange**, or **Bow Wood**, a North American tree, *Maclura aurantiaca*, which is sometimes used for hedge-making, being close-growing and spiny. It bears a fruit about the size of an orange.

**Osage River**, an affluent of the Missouri, which it joins 9 m. below Jefferson City, Mo., after a meandering course of 494 m., most of which lies in the state of Missouri. It is navigable to Warsaw, Mo., and has a drainage area of 15,444 sq. m.

**Osages**, North American Indians, a branch of the Siouan (Dakotan) family, akin to the Omahas. They were originally settled on the Osage river. Their three main sections have been mostly removed to Indian Territory.

**Osaka**, important industrial city in central Japan, on Osaka Bay, at the mouth of the Yodo River which is intersected by canals. It has a modern airdrome from which regular passenger, mail and freight services are operated. Osaka is the center of the automobile import industry, and of textile export trade for Japan. It is also the center of rice and tea trade; p. 3,394,000.

**Osborn, Henry Fairfield** (1857-1935), American palæontologist, was born in Fairfield, Conn. He became professor of biology in Columbia University in 1891, and was dean of the faculty of science in Columbia from 1892 to 1895. He was curator of vertebrate palæontology in the Museum of Natural History, New York (1891-1910), and after 1908 was president of the board of trustees. He was appointed palæontologist to the Canadian and the U. S. geological surveys in 1900.

**Osborne, Thomas Mott** (1859-1926), American manufacturer and penologist, was born in Auburn, N. Y. In 1914, while a member of the N. Y. Commission of Prison Reform, he had himself committed to the Auburn State Prison, that he might make an accurate study of prison life. In 1914 he was made warden at Sing Sing, where he put into practice a number of his methods of prison reform.

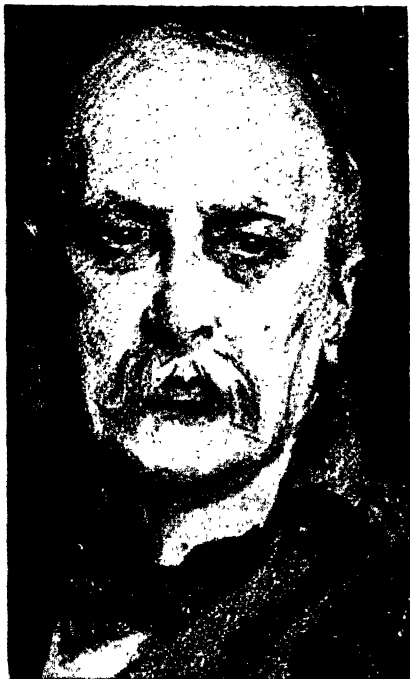
**Oscar II.** (1829-1907), king of Sweden and, until, 1905, king of Norway also, was born in Stockholm, third son of Oscar I., and succeeded his brother, King Charles xv., in 1872. The chief event of his reign was the severance of the union between the two countries of Scandinavia, which had existed since the Napoleonic era. He was succeeded by his oldest son, who became King Gustavus v.

**Osgood, Samuel** (1748-1813), American politician, was born in Andover, Mass. He was a member of the Continental Congress in 1780-84, first commissioner of the U. S. Treas-

ury from 1785 to 1789, and Postmaster-General from 1789 to 1791. He was a member of the N. Y. legislature (1800-02) and speaker of the Assembly in the session of 1800-01. He was supervisor of the port of New York from 1801 to 1803, and naval officer from 1803 until his death.

**O'Shaughnessy, Arthur William Edgar** (1844-81), English poet, was born in London, and was for twenty years associated with the British Museum, but is best known as the author of several volumes of verse, including *Lays of France* (1872), and *Music and Moonlight* (1874).

**Oshawa**, town, Ontario, Canada, Ontario co., on Lake Ontario, 30 m. n.e. of Toronto. The leading manufactures are malleable iron, automobiles, steam and gas fittings, pianos, woolen goods, leather, foundry products, and canned goods; p. 23,365.



*Sir William Osler.*

(From a charcoal drawing by John S. Sargent.)

**O'Shea, Michael Vincent** (1866-1932), American educator, was born in Le Roy, N. N. In 1897 he accepted the professorship of the science and art of education in the University of Wisconsin. He is prominently identi-

fied with university extension work. His publications include: *The Trend of the Teens* (1920); *Tobacco and Mental Efficiency* (1923); *How Much English Grammar* (1925).

**Oshkosh**, city, Wisconsin, county seat of Winnebago co., on the w. shore of Lake Winnebago at the mouth of Fox River. 76 m. n.w. of Milwaukee. Its natural advantages as a distributing center and its nearness to great forests have stimulated the development of its lumber business and allied industries. Blinds, sashes, doors, wood-working machinery, furniture, grass rugs, textiles, and matches are manufactured; p. 39,089.

**Osiers**, a name applied to certain varieties of willow grown for basket-making. In the United States there are osier plantations near Rochester and Liverpool, N. Y.

**Osiris**, chief god of the ancient Egyptians, husband of Isis. His mysteries and rites were the most important part of Egyptian wisdom. Under the late republic and empire his worship spread to Rome; and he was also worshipped in Greece, being identified with Dionysus.

**Oskaloosa**, city, Iowa, county seat of Mahaska co., 56 m. s.e. of Des Moines. It is the seat of Penn College (Society of Friends). Manufactured products include clothing, flour, wagons, heaters, brick tiles, iron and brass goods, fire brick and cement. There are deposits of coal, limestone, and fire clay nearby, and stock, grain, and hay are grown in the surrounding district; p. 11,024.

**Osler, Sir William** (1849-1919), British physician, educator, and author, was born in Bondhead, Ontario, Canada. In 1874, he was made professor of physiology and pathology at McGill, and remained a member of its medical faculty till 1884. He was clinical professor of medicine at the University of Pennsylvania in 1884-5; professor of the principles and practice of medicine in the Johns Hopkins University in 1888-1905, and physician-in-chief of Johns Hopkins Hospital during the latter period. Dr. Osler was Gladstonian lecturer in the Royal College of Physicians, England, in 1895, and subsequently Cartwright lecturer at the College of Physicians and Surgeons, New York City. His success as a teacher was marked, for he had the faculty of arousing his students to great activity and industry, and of inspiring them with his own enthusiasm. Consult Cushing's *Life of Sir William Osler* (2 vols. 1925).

**Oslo**, formerly **Christiania** or **Kristiania**, capital of Norway, and an episcopal see, is beautifully situated at the foot of pine-clad hills, on the Akers River, near its entrance into

Christiania Fjord; about 60 m. from the sea. The city is modern in aspect, with broad streets, fine buildings, and electric railways. Oslo is the industrial center of Norway and handles about a third of the country's foreign trade. The falls of the Akers furnish good water power, and manufacturing is important; weaving, spinning, iron founding, ship-building, paper milling, and tobacco manufactures are carried on. In 1924 the National Assembly of Norway almost unanimously decided to discard the name Christiania and resume the old name Oslo; p. 253,124.

**Osman I.** (1258-1326), founder of the Osmanli or Ottoman empire, the son of a Turkish chief. In 1301 he assumed power, and welded together various Turkish and Tartar tribes into a state, the people of which called themselves Osmanli, corrupted into Ottoman.

**Osmeña, Sergio** (1878- ), President of the Philippines. In 1934 he was elected Vice-President, and again in 1941. The U. S. Congress and President decreed that Quezon, the President, and Osmeña should remain in office until the Japanese were driven out. On Quezon's death in Aug. 1944 Osmeña became President.

**Osmiridium** is an alloy of osmium and iridium, found native in platiniferous sands. It is used for tipping gold pens, for delicate bearings instead of ruby, and for drawplates for making gold and silver wire.

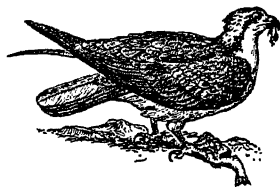
**Osmium**, Os. 191, an element of the platinum family that occurs in river sands in the Urals, and in North and South America.

**Osmosis**, the process of diffusion which takes place through a septum or membrane (parchment) separating two liquids of different density or concentration. Osmosis takes place through animal and vegetable membranes.

**Osnabruck**, town, Prussia, in the province of Hanover, 31 m. n.e. of Münster. Interesting features are a fine cathedral of the 12th-13th centuries, the Marien-Kirche (14th century), the Rathaus (15th century), in which were carried on negotiations for the Peace of Westphalia. Cigars, chemicals, nails, machinery, and musical instruments are manufactured; p. 89,079.

**Osprey**, or **Fish-Hawk**, a fish-catching bird of prey, the only member of its genus, and almost cosmopolitan in distribution, being very abundant in North America. The osprey dwells not only on seacoasts, but beside lakes and large rivers all over the Continent and feeds exclusively on fish, which it catches by

swooping upon them and snatching them up in its talons.



*Osprey.*

**Osroene, Osrhoene, or Orrhoene**, a district of ancient Mesopotamia. Its capital was Edessa.

**Ossa**, a mountain of Northern Thessaly in ancient Greece. The ancients placed the seat of the Centaurs and Giants in the neighborhood of Pelion and Ossa.

**Ossendowski, Ferdinand Anthony** (1876- ), Polish traveller and writer, was born in Witebsk. After the outbreak of the Communist Revolution he was made financial adviser to General Kolchak in Siberia and after the fall of the Kolchak government he made his way to Mongolia disguised as a peasant, an account of which is contained in his *Beasts, Men and Gods* (1923).

**Ossian**, or **Oisín**, the great heroic poet of the Gaelic people, who was the son of Finn MacCumbhal, a celebrated hero who flourished in the third century A.D. To the majority of people Ossian is known through the publications of James Macpherson, who between 1760 and 1763 published *Fingal* and *Temora*, epic poems purporting to be translations of poems composed by Ossian, son of Fingal. The truth seems to be that these so-called translations were essentially the compositions of James Macpherson.

**Ossification**, the formation of bone. Most human bones are first represented by cartilage which by a complicated series of changes becomes transformed into bone. In the larger bones of the limbs at least three centers of ossification are found—one in the shaft, and one at each extremity.

**Ossining**, town, New York, in Westchester co., on the east bank of the Hudson River, 30 m. n. of New York City. At this point the Croton Aqueduct is carried on a stone arch with an 88-ft. span, 70 ft. above the water. Near the river front is the famous Sing Sing State Prison; p. 15,996.

**Ostade, Adrian** (1610-85), Dutch genre painter and engraver, was born in Haarlem, and studied under Frans Hals. His favorite

subjects are farmyards, the interiors of rustic hovels and houses, and beer shops, and vigor and close observation, with skilful management of lights, are his noticeable characteristics.

**Ostade, Isaac** (1611-49), Dutch painter, brother of Adrian, was born in Haarlem, and was a pupil of his brother, whose style he closely followed, but after 1643 he struck out a path for himself, and excelled in roadside scenes, winter landscapes, village street life, and similar subjects.

**Ostend**, seaport town and fashionable watering place, Belgium, in the province of West Flanders, on the North Sea; 63 m. e. of Dover, and 77 m. by rail n.w. of Brussels. Ostend is an active place of transport traffic (butter, rabbits, oysters, and the like), and the resort in the season—July to September—of many tourists from other parts of Europe and from the United States. It is, moreover, an important fishing station, and has a good school of navigation. In the Great War, after the capture of Brussels it served as the temporary capital of Belgium, but was taken by the German forces and was frequently the object of air-raids and bombardment. The Belgians reentered it in October, 1918.

**Ostend Manifesto**, in American history, a document drawn up at Ostend on Oct. 18, 1854, and signed by James Buchanan, John Y. Mason, and Pierre Soulé, the American ministers at the courts of Great Britain, France, and Spain. It advocated the sale of Cuba by Spain to the United States.

**Ostenso, Martha** (1900- ), Am. author, born Norway; ed. Columbia; writes of farm people in *Wild Geese* (1925); *The Dark Dawn* (1926); *The Mad Corews* (1927).

**Osteopathy**, a system of health and healing based on the principles that: (1) the normal living body makes its own remedies to fight ill-health; and (2) the body is a vital machine whose ability so to fight depends upon its being in correct adjustment. Apart from infectious diseases, there is another field in which osteopathy is effective, including neuritis and neuralgia, lumbago and sciatica, foot troubles, disturbances of the special senses, and interference with the functions of glands, organs and systems.

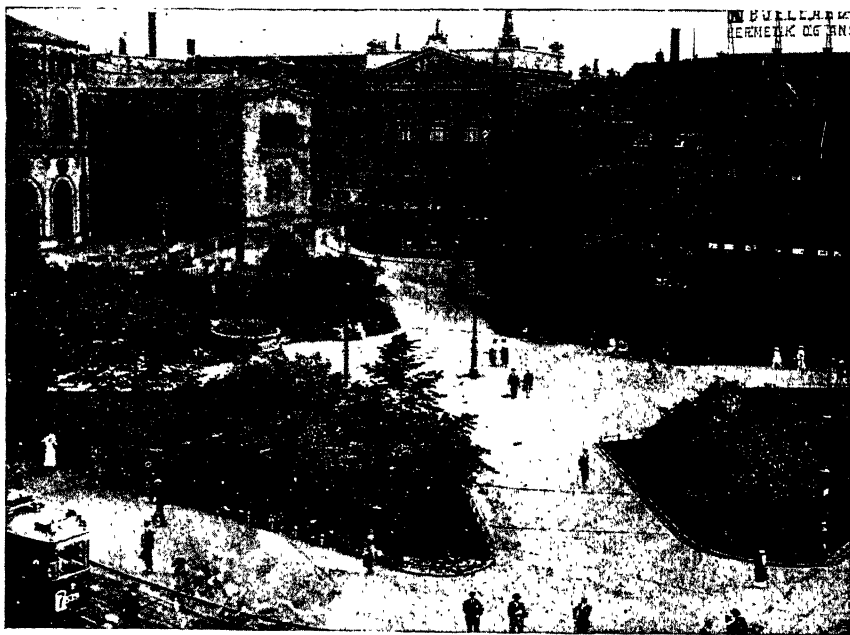
After the announcement of his discovery of osteopathy in 1874, Dr. Andrew Taylor Still went from Kansas to Kirksville, Mo. For several years he went from town to town in Missouri and Iowa, treating diseases of all kinds by his new method and effecting many remarkable cures. More and more, patients

came from distant parts, until he was totally unable to care for them, and in 1892 he organized the American School of Osteopathy from which the first class was graduated in 1894.

Although osteopathy met with considerable opposition, its growth was rapid. It was introduced into Hawaii in 1897, into Canada in 1898 and is now practised in Australia, China and Japan, as well as in Great Britain and Ireland and continental Europe. In 1939, there were six colleges of osteopathy in the United States. There are 10,000 or more osteopathic physicians in the United States, organized into

**Ostracoda**, an order of minute Crustacea, in which the body is enveloped in a bivalve shell and the abdomen is rudimentary.

**Ostrich**, a name applied both to the true African ostrich (*Struthio*) and to the Rhea or American ostrich. The African ostriches are the largest of the Ratitæ or running birds, and indeed the largest of existing birds. The ostrich prefers dry, sandy wastes, or regions covered by low bush. The long neck gives a wide range of vision, and the birds in the wild state are extremely shy and wary. The food of the ostrich in the wild state consists of grass, leaves, seeds, and fruit, mingled to a greater



© E. M. Newman; from Publishers Photo Service.

Oslo, Norway: Plaza Before the Houses of Parliament.

the American Osteopathic Association and state and local societies.

**Ostia**, a city of Latium and the harbor of ancient Rome, at the mouth of the Tiber; 14 m. s.w. of Rome. It first acquired importance from its salt works, and afterward as the port where the Sicilian, Sardinian, and African corn shipped for Rome was landed.

**Ostracism**, a right exercised by the people of Athens of banishing for a time any person whose services, rank, or wealth appeared to be dangerous to the liberty of his fellow citizens, or inconsistent with their political equality.

or less extent with animal matter. Like all running birds, the ostrich is polygamous, the male consorting usually with from two to seven females. There is no true nest; the hens belonging to one cock deposit their eggs in common in a shallow excavation in the sand, dug by the male.

Various contradictory statements have been made in regard to the part played by the two sexes in incubation, but there is no doubt that the cock alone undertakes this task at night. During the day incubation is necessary only in the cooler parts of the ostrich's range; elsewhere the eggs are merely left to the heat of



the sun. The long and beautiful plumes of the ostrich have been highly valued for ornamental purposes from very early times, and form a considerable article of commerce. Determined and successful efforts were made about 1865 to domesticate them in Cape Colony. The decreased demand for ostrich feathers during the Great War seriously reduced the output. The similarity of climatic conditions between South Africa and Southern California and Arizona led to experiments in those two States from 1882 onward, which have resulted in the formation of an extensive industry in ostrich farming. Smaller farms have been successfully established in Texas,

pieces are *The Poor Bride*, *Poverty is No Disgrace*, and *The Dowerless Girl*.

**Ostwald, Wilhelm** (1853-1932), German chemist and philosopher, was born in Riga, Russia. In 1887 became professor of general chemistry and director of the Physico-Chemical Institute of Leipzig University, from which he retired in 1906. There he founded the Ostwald Institute, the first school for the special study of physical chemistry. In 1909 he was awarded the Nobel Prize for Chemistry.

**Ostyaks**, Siberian aborigines. The *Eastern Ostyaks* are commonly regarded as a southern branch of the Samoyedes. The *Western Ostyaks* form one of the three main branches of



*Ostriches on an Ostrich Farm.*

Arkansas, Florida, Mexico, and elsewhere on the American continent.

The beautiful white plumes so highly prized all over the world grow in the ends of the wings of the male birds, a good bird in his prime yielding from twenty to forty of these, besides a few black feathers, also from the wings. The plumes of the hen from her wing tips are generally spotted and flecked with gray, and are called 'feminines.' The bird's plumage has reached perfection when three years old, and at four years the birds have attained maturity.

**Ostrovksi, Alexander Nikolaievitch** (1823-86), Russian dramatist, was born in Moscow. He was distinguished for the portrayal of middle-class life, more especially the merchants of Moscow. His greatest play is *The Storm* (1860; Eng. trans. by Constance Storm), which was produced at the Carnegie Lyceum, New York, in 1900. Other notable

the Ugrian Finns, the other two being the Voguls of the Ural Mountains and the Magyars of Hungary.

**Oswald, Eleazer** (1755-95), American soldier and journalist, was born in England. In 1782 he published at Philadelphia *The Independent Gazetteer* and *The Price Current*, the latter being the first commercial paper in the United States. He also published in New York City *The Independent Gazette* (1782-87).

**Oswald, St.** (d. 992), English ecclesiastic, was consecrated by Dunstan to the see of Worcester (961), and in 972 became archbishop of York. His efforts were chiefly directed toward the purification of the monasteries.

**Oswego**, city, New York, county seat of Oswego co., a terminus of the New York State Barge Canal, 34 m. n.w. of Syracuse. The Oswego River falls 34 ft. at this point, and the abundant water power is utilized for the manu-

facture of shade cloth, matches, knitted goods, boilers and engines, oil-well supplies, sashes and blinds. The city is an important port, with a breakwater, several large elevators, and 4 m. of wharves; it carries on trade with Canada, particularly in importing lumber and exporting coal; p. 22,062.

**Oswego**, city, Kansas, county seat of Labette co., on the Neosho River, and the Missouri, Kansas and Texas and the St. Louis-San Francisco Railroads; 60 m. s.w. of Fort Scott. An abundance of natural gas and water power is used in the manufacture of flour and lumber products; p. 1,953.

**Oswego Tea**, a name given to several species of Monarda. They belong to the natural order Labiatae, somewhat resemble mints in appearance, have an agreeable odor, and are much visited by bees.

**Otago**, provincial district, at the southern end of South Island, N. Z. It is 160 m. long by 190 m. broad, and has an area of 25,487 sq. m. Otago produces one-third of the gold of New Zealand, also oats and rye; p. 85,420.

**Otaheite**. See Tahiti.

**Otalgia**, or pain in the ear, is a term properly used of neuralgia.

**Otho**, or **Otto** (912-973), surnamed the Great, Holy Roman emperor, was the son of Henry I., whom he succeeded in 936. The principal events of his reign were rolling back the invasion of the Magyars, whom he defeated on the Lechfeld, near Augsburg (955), and two expeditions into Italy.

**Otho II.**, or **Otto** (955-983), Holy Roman emperor, was the son of Otho I., whom he succeeded in 973. Otho crossed the Alps into Italy, and made himself master of Apulia and Calabria; but the dispossessed Greeks, having summoned to their aid the Saracens of Sicily, defeated him near Cotrone in Calabria (982).

**Otho III.**, or **Otto** (980-1002), Holy Roman emperor, succeeded his father, Otho II., at the age of three, and was crowned by Pope Gregory V. in 996. After he had appointed his own tutor, Gerbert, pope as Sylvester II., the young emperor's ascetic observances and dreams of reviving the glories of the ancient Roman empire were nipped in the bud by a fresh outbreak of the restless Italians.

**Otho IV.** (1174-1218), Holy Roman emperor, was the son of Henry the Lion, Duke of Bavaria, and Matilda, daughter of Henry II. of England. He was in 1197 chosen German king. Otho was elected emperor, and was crowned at Rome by Pope Innocent III. in 1209.

**Otis, Fessenden Nott** (1825-1900), American physician, was born at Ballston Spa, N.Y.

His numerous surgical inventions include the urethrometer and the dilating catheter.

**Otis, Harrison Gray** (1765-1848), American orator and statesman. He was a nephew of James Otis, and was born in Boston. In 1817 he was elected to the Federal Senate, where he distinguished himself in the debates over the Missouri question. In 1823 he was the Federalist candidate for governor of Massachusetts and was defeated, and in 1829 was elected mayor of Boston.

**Otis, James** (1725-83), patriot leader in the American Revolution, born in West Barnstable, Mass. In May, 1761, he was chosen a representative from Boston to the General Court, and was thenceforth prominent and increasingly active in the revolutionary agitation. Of his pamphlets, that entitled *The Rights of the British Colonies Asserted and Proved* (1764), is the most notable. In May, 1766, he was elected speaker of the House, but the choice was negated by Gov. Hutchinson. On Sept. 4, 1769, he published in the *Boston Gazette* a violent attack on the commissioners of customs appointed under one of the Townshend acts of 1767. The following evening he was brutally assaulted in a coffee-house by John Robinson, one of the commissioners, receiving a cut on the head, from the effects of which he never recovered. His public career virtually ended at this time, though he did not finally retire from the House of Representatives until 1771; and for the remainder of his life he was, save at intervals, insane.

**Otis, Norton P.** (1840-1905), American manufacturer, was born at Halifax, Vt. He was a son of Elisha G. Otis, inventor of the 'Otis elevator,' and with his brother Charles succeeded to the management of the manufacturing business. From 1903 to 1905 he was U. S. Congressman from the 19th New York district. In 1900 he was appointed president of the N. Y. Commission to the Paris Exposition.

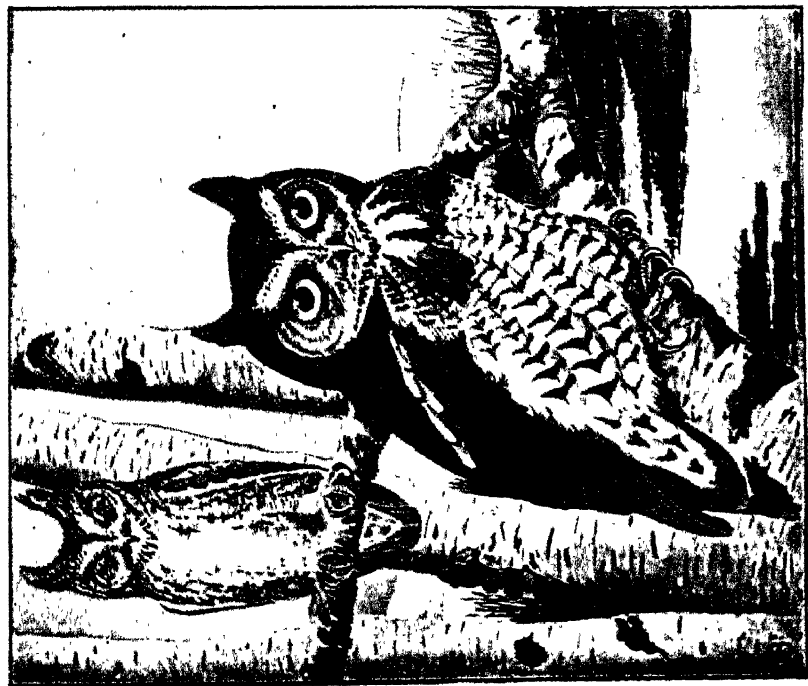
**Otitis**, inflammation of the tympanic cavity of the ear.

**Otoliths**, are concretions of calcium carbonate which occur within the labyrinth of the ear in all vertebrates. The function is doubtless the stimulating of the sensory cells which line the internal ear when its fluid is thrown into vibration.

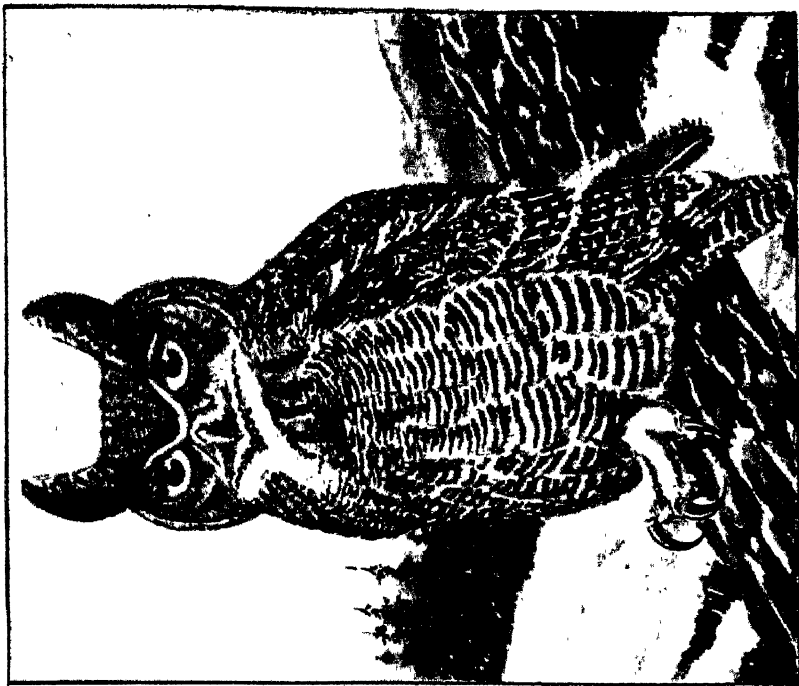
**Otranto**, town, Lecce province, Italy, on the west shore of the Strait of Otranto. The ruined castle has been immortalized by Walpole in his novel, *Castle of Otranto*; p. 2,953.

**Otsego Lake**, small lake in Otsego co., New York, source of the Susquehanna River.

**Ottawa**, city, capital of the Dominion of



SCREECH OWL (1/4 nat. size)



GREAT HORNED OWL (1/6 nat. size)

FROM DRAWINGS BY R. I. BRASHER



Canada, and county seat of Carleton co., Ontario, is situated on the Ottawa River at its confluence with the Rideau and Gatineau Rivers. 225 m. n.e. of Toronto and 100 m. w. of Montreal. The chief features of interest are the Parliament Buildings of Gothic design. The Main Building in which the legislative bodies assemble was destroyed by fire in 1916, but has been rebuilt along the same lines of architecture, at a cost of \$10,000,000. Within a short distance of Rideau Falls is Rideau Hall, the residence of the Governor-General of Canada. The chief educational institutions are Ottawa University, the Provincial Normal Model School, Ottawa Ladies College and Ashbury College.

Ottawa is the chief lumber center of the Dominion, the normal average production being from 450,000,000 to 500,000,000 ft. of lumber a year. Other manufactures are brick, paper, pulp, fiberware, matches, furniture, marine gas buoys, cement, tents, electric cars, foundry and machine shop products. Originally Ottawa was called Bytown, after Colonel By, its founder. It was incorporated under its present name in 1854, and was chosen as the seat of government in 1858, and later in 1867 as the capital of the Dominion of Canada; p. 124,988.

Consult B. Davies, *The Charm of Ottawa* (1932); T. M. Longstreth, *Quebec, Montreal, and Ottawa* (1933).

**Ottawa**, city, Illinois, in La Salle co., is situated at the confluence of the Fox and Illinois Rivers. Facilities for transportation and abundant supplies of coal, pottery and brick clay, and cement and glass sand from the surrounding country, together with grain and produce, have led to the development of a large trade; p. 16,005.

**Ottawa**, a tribe of North American Indians, speaking a distinct dialect of the Algonquin language, formerly living on the Ottawa River in Canada. Historically they are noted for their chief Pontiac. They now number some 4,500 living on Manitoulin and Cockburn islands, Canada, and in Oklahoma and Michigan.

**Ottawa River**, Canada, the most important tributary of the St. Lawrence, rises in Northern Quebec, on the Laurentian divide, 160 m. n. of Ottawa, flows w. to Lake Temiscaming, then s.e. and e. between Ontario and Quebec, and empties, by two mouths forming the island of Montreal, into the St. Lawrence. Its lumber trade is one of the largest in the world, and its falls furnish enormous water power.

**Ottawa University**, a Roman Catholic institution, maintained under the direction of the

Oblate Fathers, in Ottawa, Canada; founded in 1848. In 1889 it was raised to the rank of a Catholic university by authority of Pope Leo XIII.

**Otter**, an aquatic carnivore of the family Mustelidae, genus *Lutra*. The body is elongated with no marked constriction in the neck region, so that the animal can easily glide through the water. The limbs are short, the toes webbed, the claws small, curved, and blunt. The fur is close, thick, and glossy, so as readily to throw



Otter.

off the water, and of an almost uniform dark brown tint. In North America otters (*L. canaensis*) were formerly everywhere abundant, but have now become exceedingly scarce. Otters are readily tamed, and attach themselves to their masters like a dog, but are inclined to be surly and snappish.

**Otter Sheep**, or **Ancon Sheep**, a name given to a breed of sheep which originated in Dover, Mass., about 1791. The introduction of better breeds of sheep caused its neglect, however, and by 1813 specimens were rare.

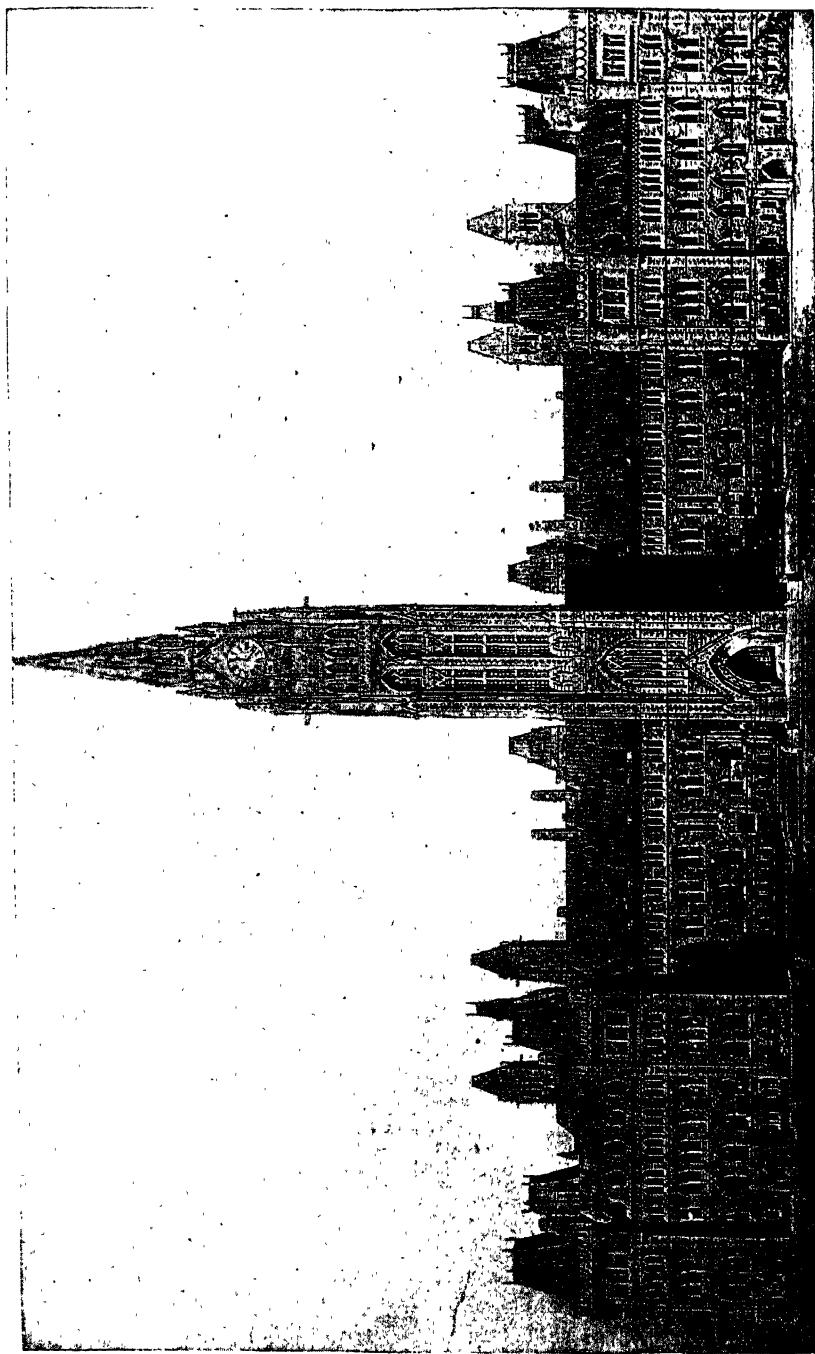
**Otto, Archduke of Hungary** (1912- ), eldest son of the late Emperor—King Charles and Empress Zita. Hungary is officially a kingdom under a regency and of the several Hapsburg possibilities for the throne, Otto is the most logical candidate. In 1933 a growing royalist party desired to place Prince Otto on the throne. After the outbreak of World War II, Otto and his family came to the U. S.

**Ottoman Empire**. See **Turkey**.

**Ottumwa**, city, Iowa, county seat of Wapello co., on the Des Moines River. Its fine waterpower, facilities for transportation, and location in the bituminous coal fields of Iowa and in a rich agricultural district have contributed to the development of important industries. The chief industries are meat packing and the manufacture of farm machinery; p. (1930) 31,570.

**Otway, Thomas** (1652-85), English dramatist, was born at Trotton, near Midhurst, Sussex. His real fame rests on the tragedies *The Orphan* and *Venice Preserved*, the latter being one of the greatest of modern English dramas.

**Ouachita River**, or **Washita River**, a



*New Parliament Building (Main Block), Ottawa, Canada.*

*Courtesy Canadian Pacific.*

tributary of the Mississippi, rises in Western Arkansas, and flows s.e. to its entrance into the Red River just above the junction of the latter with the Mississippi. Length, 545 m.; drainage area, 19,138 sq. m. It is navigable to Camden, Arkansas.

**Oudh**, or **Ajodhya**, city, near Faizabad, United Provinces, India, on the right bank of the Gogra; 77 m. e. of Lucknow. The city is small (about 12,000), but its Jain temples attract about 500,000 pilgrims at the annual fair.

**Ouida**, *nom de plume* of **Louise de la Rameé** (1840-1908), English novelist, born at Bury St. Edmunds. Among her numerous novels the best are *Chandos* (1866), *Under Two Flags* (1867), and *Moths* (1880). From a literary point of view full of defects in style,

**Ounce**, or **Snow Leopard** (*Felis uncia*), a near ally of the leopard, inhabiting the high mountain regions of Central Asia.

**Ouse**, river, Yorkshire, England, is formed by the union of the Swale and the Ure in the immediate vicinity of the village of Borough-bridge. It is 57 m. long, and is navigable to York.

**Ouse, Great**, river, England, rises in the southwestern part of Northamptonshire, the main stream being conducted for the last few miles through an artificial channel, the Eau Brink. The river is 160 m. long and is navigable to Bedford.

**Ouseley**, **Sir Frederick Arthur Gore** (1825-89), English musical composer, chiefly of sacred music, was born in London and be-

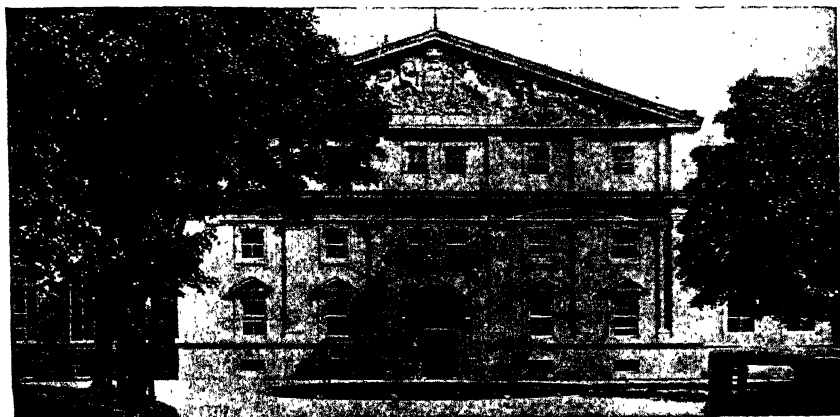


Photo Courtesy of Canadian Pacific.

*Rideau Hall, Ottawa: Residence of the Governor-General of Canada.*

Ouida's books show a vigor and a certain power of character drawing, combined with an originality and dexterity in plot and treatment, which account for their popularity. Her *Dog of Flanders* (1872) and *The Nurnberg Stove* are charming stories for children.

**Ouija Board**, a rectangular piece of polished wood on which are inscribed the letters of the alphabet, the numerals, and the words yes and no. On this board is placed a small triangle of wood mounted on three legs and on this triangle the persons using the board place their hands lightly. When questions are asked, this triangle moves, presumably with no volition on the part of the sitters, stopping at the words yes or no or at the letters which spell out the answer it wishes to convey.

**Ounce**, a unit of weight, originally, as it now is in troy weight, the twelfth part of a pound. but in avoirdupois the 16th part.

came (1856) vicar of St. Michael's, Tenbury. The whole of his fortune was devoted to the endowment of St. Michael's College, Tenbury, for the training of choristers, and to this college he left his valuable musical library.

**Outcrop**, in geology, the name given to the edges of strata as they appear or crop out at the surface.

**Outlawry**, a term meaning putting one beyond the protection of the law of the land by a regular process. The process has not been used in the United States since the Revolution. The popular application of this name to a notorious criminal, who continues his crimes in defiance of the state, is now technically correct.

**Outposts** are detachments thrown out by bodies of troops when halted to secure them from surprise and to allow of their taking rest in safety. Patrols are largely used in con-

nection with outposts. Those used for this purpose are small parties of two or more men under a non-commissioned officer, sometimes accompanied by an officer.

**Ouzel.** The name ouzel-cock is applied by Shakespeare to the blackbird.

**Ovampo,** or **Ovambo,** an African people, who, with the kindred Ovaherero, constitute the southwestern division of the Bantu family. They number about 100,000, and are agriculturists. Physically they are a fine race—tall, robust, with regular features and bright, intelligent expression.

**Ovary,** the ovum or egg-producing organ. The adult human ovaries are somewhat almond shaped bodies, about an inch and a half in length, each attached by ligaments both to the uterus and to a Fallopian tube. They may be absent, or never develop functionally. They are sometimes the sites of cysts or tumors, or become inflamed or displaced. In serious cases of disease the ovaries are sometimes removed by operation (ovariotomy). The removal of one ovary does not prevent subsequent pregnancy, provided the remaining ovary is healthy.

In mammals generally the ovary displays essentially the same structure as in man, but in other vertebrates it is histologically simpler. In botany, the ovary is the lower part of the pistil of a flower. It is really the hollow of a carpel, and it is the organ which contains the ovules, or as yet unfertilized seeds. See FLOWER.

**Ovation,** the honors accorded at ancient Rome to a successful general whose achievements were not held worthy of a regular triumph.

**Oven,** an enclosed chamber for bread-baking and cooking generally. It requires to be equally heated, and may be either internally or externally fired. The original type of oven is of the former kind.

**Oven-bird.** In the United States, the golden-crowned 'thrush,' one of the wood-warblers. It is bold and familiar, and builds its peculiar oven-like nest by preference near a human habitation.

**Overbeck, Johann Friedrich** (1789-1869), German painter, born at Lübeck. His greatest work in fresco is the *Vision of St. Francis*, at Assisi. The delicacy of feeling which marks his work appears to perfection in his water-color drawings and cartoons on religious subjects. His name is inseparably connected with the revival of Roman Catholic art.

**Overijsel,** prov., Netherlands, between Zuyder Zee and Prussian provinces Hanover

and Westphalia. Dairying, fishing, cotton manufacture, and brickmaking are chief industries. Cap. Zwolle; p. 513,189.

**Over-production** is a term much used in recent economic discussion to denote a condition, possibly theoretic, of a surplus of supply both in agricultural products and in factory output in excess of the demand for such products. A concrete example was the excess of cotton produced year after year in face of a decreasing demand. This was first met by the



*Oven-bird and Nest.*

Government at Washington by purchase and retirement from the market of a tremendous number of bales of cotton, running far into the millions. The theory was that this act would stabilize the market and tend to raise the price of cotton to a figure at which the growers could make a fair profit. When even this measure failed, under conditions of the world economic depression, to produce the desired results, two more steps were taken: (1) the restriction of planting and harvesting by the individual growers, as, for instance, the ploughing under of every third row of cotton, and (2) in 1934 the payment by Federal agencies to the farmers of sums in the form of a virtual 'bonus' for not planting a portion of their acreage. All this was done in the belief that there was an actual condition of over-production of cotton, in excess of possible demand.

Cotton was not the only product treated in this manner. An excess of pork products was handled in a similar way. An apparent future surplus of citrus fruits is causing discussion of a plan to limit annual production to 75 per cent. of its present total.

These examples show the theory with experimental remedies in application. But the condition and its cure is not simple; nor has there been sufficiently long experimentation to justify conclusions as to the success of these



measures over a term of years. The crux of the matter is as to what constitutes a state of over-production. Granted a present surplus in products over the purchasing power of the American and foreign public, there is to match this condition a deplorable lack of purchasing power due to successive years of depression with unemployment. If conditions were normal, if a proper standard of living was being maintained by a suitable number of families and individuals in every community, there would be, according to economists, no surplus of food, of clothing, of machinery, of automobiles, of other necessities and semi-luxuries. Indeed, after a brief period of years, there would certainly be a serious shortage, if there is not one existing now.

That is why the condition of over-production is termed by many to be apparent not actual. But the results are the same in creating a vicious circle which administrators of the New Deal are endeavoring to break. An excess of production over current market demand causes low prices which yield little or no profit to the farmer or manufacturer or may result in actual loss. This in its turn causes unemployment, which again results in still greater diminution of purchasing power. The way out of this economic dilemma is obviously the establishment of a proper standard of living for the bulk of the population, with a balancing of number of hours of daily productive labor with a suitable return in wages to maintain such a standard, and a stabilized currency on which to rest our economic structure. The effort to accomplish this state of affairs is now the concern of all business, labor, farm and governmental groups.

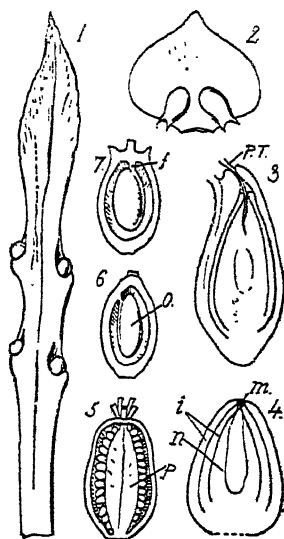
**Overture**, a species of musical composition. Gluck was the earliest of the operatic composers who wrote the overture in a form which portrays the dramatic action of the work it precedes; in overtures belonging to this class that to Mozart's *Magic Flute* is second only to the greatest of all—Beethoven's *Leonore No. 3*. Some operatic overtures consist entirely of subject-matter contained in the following work; in this form Weber and Wagner have left unrivalled examples. The title is also given to orchestral productions written solely for concert use.

**Ovid** (43 B.C. to 17 A.D.), Latin poet, born at Sulmo in the Apennines. Ovid is much the most voluminous of the Latin poets, his extant works containing over 33,000 hexameter or elegiac lines. These works are: *Heroides*, *Amores*, *Ars Amatoria*, and *Metamorphoses*.

Perhaps his best work is to be found in the *Amores*.

**Oviparous**, a term formerly used to designate animals which lay eggs, in contradistinction to the viviparous forms, which give birth to living young. As a matter of fact, however, all animals develop from eggs, whether these hatch within the body of the mother or outside it.

**Ovule**, a name applied to the small bodies attached to the placenta within the ovary of a flower. When fertilized, ovules become transformed into seeds.



The Ovule and its Attachment.

1. Scale of *Cycas*, and four ovules. 2. Scale of pine, and two ovules. 3. Section of ovule of *Enothera*; P.T., pollen tube. 4. Ovule of *Polygonum* (sessile erect): *i*, integument; *m*, micropyle; *n*, nucleus. 5. Ovary of *Cerastium*: *p*, placenta. 6. Ovary of *Daphne*, with suspended ovule. 7. Ovary of *Hippuris*, with pendulous ovule: *f*, funiculus.

**Ovum**, a nucleated cell, formed in the ovary of the female, that may produce a new individual by a process of segmentation, usually after impregnation.

**Owatonna**, city, Minnesota, county seat of Steel co., on the Straight River. The chief

manufactured products are flour, foundry and machine shop products, canned goods, butter-tubs, churns. The city is in the centre of the Minnesota dairy district and has a large agricultural trade and four large nurseries; p. 8,694.

**Owego**, village, New York, county seat of Tioga co., at the junction of Owego Creek with the Susquehanna River. Its fine location, at the gateway of the picturesque Finger Lakes region, has made it an attractive place of residence and a summer resort. Owego is the center of a rich farming country and has a large lumber trade and a number of creameries; p. 5,068.

**Owen, Robert** (1771-1858), Welsh socialist and philanthropist, was born in Newtown, Montgomeryshire. He purchased a factory at New Lanark, Lanarkshire, where he labored with constant zeal to teach his employees the advantages of thrift, cleanliness, and good order, and organized a system of education including infant schools, of which he was the pioneer in the United Kingdom. Having become interested in the co-operative idea, he went in 1824 to the United States, where he established a community at New Harmony, Indiana. This proved a failure.

**Owen, Robert Dale** (1801-77), American social reformer, son of Robert Owen, was born in Glasgow, Scotland. From 1828 to 1832 he edited in New York City the *Free Inquirer*, a weekly socialistic and agnostic periodical. He then removed to New Harmony, Ind., served in the Indiana legislature (1835-8), was U. S. representative from Indiana (1843-7), and in that capacity secured the passage of a resolution relating to the occupation of Oregon, which was afterward effective in settling the northwestern boundary question. He was prominent in the organization of the Smithsonian Institution in Washington, and became one of its regents. From 1853 to 1858 he was successively U. S. chargé d'affaires and minister at Naples.

**Owen, Robert Latham** (1856- ), American legislator, was born in Lynchburg, Va. In 1885-9 he was U. S. Indian agent for the Five Civilized Tribes in Indian Territory. He was the author of an act of Congress giving citizenship to Indians in Indian Territory.

**Owen, Ruth Bryan** (1885- ), author, lecturer, was born in Jacksonville, Ill., the daughter of William Jennings Bryan. She was a member of the 71st and 72nd Congresses (1929-33), from the 4th Florida District. She was United States minister to Denmark, 1933-1936.

**Owensboro**, city, Kentucky, county seat of Daviess co., on the Ohio River. It has an extensive trade in coal and clay, and is one of the largest leaf and strip tobacco markets in the United States; p. 30,245.

**Owl**, any of a certain group of nocturnal birds of prey. The head is large and the neck thin, the great eyes are surrounded by a characteristic radiating disc of feathers, and there may be also a tuft of feathers above them, forming the so-called 'ears' or horns. Owls are extremely useful in agricultural communities, as they destroy great numbers of mice and insects injurious to crops.

Of N. American owls the best known are the great horned, or hoot owl (*Bubo virginianus*), the grayish barred owl (*Syrnium nebulosum*), both widely distributed, and the still more common and familiar little mottled owl (*Megascops asio*) which is sometimes pure gray, sometimes almost wholly pale red, and sometimes a mixture of the two colors.

**Oxalic Acid** (COOH)<sub>2</sub>, a dibasic acid occurring in plants, notably wood sorrel. It is manufactured commercially by the action of air on sawdust in presence of a mixture of caustic potash and soda. Oxalic acid is poisonous, like other strong acids, and is sometimes taken by mistake owing to its resemblance to Epsom salts. In cases of poisoning, administration of lime water or chalk, followed by castor oil, is probably the safest treatment. Oxalic acid is used in calico-printing, and for cleaning brass.

**Oxalis**, a genus of herbaceous plants, belonging to the order Geraniaceæ. Many of the species thrive in dry, sandy soil in warm situations.

**Oxford**. Municipal and parliamentary borough, episcopal see, and county town of Oxfordshire, England, is situated at the junction of the Thames and the Cherwell, 55 m. w.n.w. of London. Though mainly famous as the seat of the oldest English university, the city has a separate history of its own. It owes its importance as commanding one of the chief fords of the Thames. In the 12th century the presence of students at Oxford begins to be recorded, and the first trace of academic organization occurs in 1214. By the end of the century there were 4,000 students. In the 14th century Oxford was second to no university in Europe as a home both of scholastic philosophy and of natural science; the names of Duns Scotus and Roger Bacon are famous. Under Laud, both as president of St. John's (1611-21) and as chancellor of the University (1630-41), it became a high church and loyalist

center. To this period belongs the beginning of true natural science in Oxford, which culminated in the founding of the Royal Society in 1662. Since the beginning of the 19th century the number of undergraduates at the University has more than doubled. The privileges of Oxford have been extended to women, though they are not admitted to degrees.

The following are the chief colleges and institutions comprising the University:—

All Souls College, founded in 1437; Balliol, in 1263; Brasenose, in 1509; Christ Church, which is the cathedral of the diocese as well as a college of the University, in 1525 and 1546; Corpus Christi, in 1516; Exeter, in 1314; Hertford, in 1874; Jesus, in 1571; Keble, in 1870;

bers. The University has sole control of the examinations, and provides part of the instruction, especially in natural science.

**Oxford**, village, Butler co., Ohio; is the seat of Miami University, and two colleges for women—Oxford and Western; p. 2,756.

**Oxford**, town, Mississippi, county seat of Lafayette co. The University of Mississippi, Union College (Female), Oxford Academy (Male), and an agricultural college are situated here; p. 3,433.

**Oxford Movement**, the religious revival which commenced at Oxford in 1833, and was at first known as the Tractarian Movement. It amounted to a bold attempt to reorganize the worship and life of the Church of England



*Oxford.*

Upper Left, Oriel; Upper Right, St. John's; Lower Left, Christ Church Cathedral and Chapter House; Lower Right, Christ Church and Tom Tower.

Lincoln, in 1429; Magdalen, in 1458; Manchester New College, a theological college removed from London to Oxford; Mansfield, also theological, transferred to Oxford in 1886; Merton, founded in 1264; New College, in 1386; Oriel, in 1324; Pembroke, in 1624; Queen's, in 1340; St. John's, in 1555; Trinity, in 1555; University, in 1280; Wadham, in 1610; Worcester, in 1714. The Bodleian Library contains rich treasures of the past as well as complete collections of the present British publications.

The colleges of the University are self-governing, and fill vacancies in their governing bodies. In the main, they also provide for the instruction and discipline of their mem-

bers on primitive lines, and restore it to a position higher than that of an institution of the state. In 1844 and the following years the movement received its heaviest blow in the secession to Rome of some of its most trusted pioneers (two of them, Manning and Newman, afterward cardinals). But its influence was great and far-reaching, and is still felt. Consult Dean Church's *The Oxford Movement*.

**Oxfordshire**, or **Oxon**, an inland county of England, is bounded on the n. by Warwickshire and Northants, e. by Bucks, s. by the River Thames, and w. by Gloucestershire. The north consists generally of bleak downs. The Oxford and Birmingham Canal affords

access to the midland coal fields. Agriculture is the chief industry. Oxfordshire was the scene of important events during John's reign, and during the Civil Wars. Area, 744 sq. m.; p. 129,059.

**Oxidation**, primarily a chemical reaction in which oxygen is combined with a substance, as when mercuric oxide is formed from mercury.  $2\text{Hg} + \text{O}_2 \rightarrow 2\text{HgO}$ . The term is also used in a wider sense to include those reactions in which, by the combination of a negative element or removal of hydrogen or a positive element, a compound is obtained corresponding to a higher degree of oxidation, although oxygen itself is not added.

**Oxides**, the compounds formed by the union of oxygen with other elements or with compound radicals. They are of very common natural occurrence, many of them having been produced by the action of the atmospheric oxygen. Examples are water,  $\text{H}_2\text{O}$ ; silica,  $\text{SiO}_2$ ; hematite,  $\text{Fe}_2\text{O}_3$ ; pyrolusite,  $\text{MnO}_2$ ; and carbon dioxide,  $\text{CO}_2$ . See OXYGEN and the various elements.

**Oxpeckers, Beef-Eaters, or Buffalo Birds** (*Buphaga*), passerine birds belonging to the starling family, which feed on the parasites that infest domestic cattle. The genus is restricted to Africa.

**Oxy-acetylene Flame**, the product of a mixture of oxygen and acetylene gases as used in a blow-pipe or torch when a very high temperature is required. In the best solid fuel furnaces the highest temperature attained is about  $3,000^\circ \text{F.}$ ; the oxy-hydrogen flame gives about  $4,000^\circ$ ; while the oxy-acetylene flame reaches  $6,300^\circ \text{F.}$ , and is the hottest known.

The oxy-acetylene flame is used for the direct autogenous welding of steel, and as a substitute for soldering and brazing. It is also used for cutting and trimming masses of metal, such as armor plates.

**Oxychlorides**, or **Basic Chlorides**, are compounds that may be considered as consisting of a chloride and an oxide or hydroxide at the same time. Bismuth oxychloride, or 'pearl white' ( $\text{BiOCl}$ ), and antimony oxychloride ( $\text{SbOCl}$ ) are examples.

**Oxygen**, O, 16.00, one of the chemical elements; gaseous at ordinary temperatures, is of great importance on account of its participation in the chemical processes associated with life, and in combustion. The name (the Greek words meaning 'sour' and 'to produce'), was given by Lavoisier, indicating the erroneous view that it is a necessary constituent of all acids.

Oxygen was first obtained by Stephen Hales

in 1727, but he failed to recognize it as a new element. Priestly discovered it in 1774, when heating mercuric oxide with the aid of a 'burning glass.' Oxygen is the most abundant and widely distributed element, comprising nearly half of the earth's crust. Air is about 1.5 oxygen by volume; and water, its compound with hydrogen, is about 8.9 by weight. Oxides, silicates, and carbonates are its principal mineral compounds—as sand, clay, chalk, limestone, marble, etc. In combination with carbon and hydrogen, or carbon, hydrogen, and nitrogen, it enters into the structure of all animal life, being an important constituent of sugar, starch, fats, albumen, all carbohydrates, and proteids, woody fiber, etc. The human body contains about 66 per cent. It is a constituent of all acids, bases, and salts except the halogen acids, the halide salts, and a few others.

Oxygen, at atmospheric pressure, is a solid below  $-227^\circ \text{C.}$ , a liquid between  $-227^\circ \text{C.}$  and  $-182^\circ \text{C.}$ ; and a gas above  $-182^\circ \text{C.}$  Gaseous oxygen is colorless, odorless, and tasteless. Chemically, oxygen is very active, capable of combining with all the elements except bromine, fluorine, and the inert elements of the atmosphere, forming oxides, and generally with the liberation of large quantities of energy. It is, for this reason, the supporter of combustion. No ordinary combustion can take place without oxygen. A ton of good anthracite coal, for example, requires 2.7 tons of oxygen to consume it.

The function of oxygen in respiration is similar, though greatly moderated; and it is essential to all animal life. A healthy man at rest consumes daily about 25 cubic ft. (about 2 pounds). It passes through the membranes of the lungs into the blood, and is taken up in loose combination by the hæmoglobin of the red blood corpuscles, giving the bright appearance to arterial blood. Oxygen is thus carried to all parts of the body, in the circulation, and is given up to enter into the various combinations as required in the tissues, the heat liberated in these reactions serving to maintain the body temperature. Violent physical exercise causes rapid oxidation in the tissues, and respiration is automatically quickened. Animals are not capable of breathing pure oxygen, however. Fishes obtain their oxygen through their gills from that held in solution in the water. Oxygen is exhaled by the green leaves of plants in sunlight. Under suitable conditions, oxygen may be converted into its allotropic form Ozone.

**Oxyhydrogen Flame** is produced by the

combustion of a mixture of hydrogen, or more usually coal gas or hydrocarbon vapor, with oxygen at a specially constructed burner. The flame is intensely hot, approximating from  $2,000^{\circ}$  to  $2,500^{\circ}$  C.

**Oxyrhynchus**, (now known as **Behnesa**), an extensive cluster of mounds on the edge of the Libyan Desert, is the site of an ancient city from among whose ruins thousands of valuable papyri have been excavated, including some otherwise unknown 'Sayings of Jesus.'

**Oxyrhynchus** (*Mormyrus oxyrhynchus*), a fish of the Nile, allied to the pike, which is highly esteemed for food. The name is also used to distinguish a variety of the American sturgeon abundant from New England to the Carolinas.

**Oyama, Prince Iwao** (1844-1916), Japanese soldier, was born in Kagoshima. During the Franco-German War he went to France to study tactics, and on his return to Japan assisted in the reorganization of the army. On the outbreak of the war with China he was appointed commander-in-chief of the Second Japanese Army Corps. Landing on the Liaotung Peninsula, he took Port Arthur by storm, and crossing to Shantung, captured Wei-hai-wei. During the Russo-Japanese War, in 1904, he was commander-in-chief in Manchuria; and after Russia's defeat, due largely to his brilliant tactics, he was raised to the rank of prince (1907).

**Oyapok River**, river of South America, forming the boundary between French Guiana and Brazil. Its course of about 300 m. is through rough country, and is much impeded by rapids.

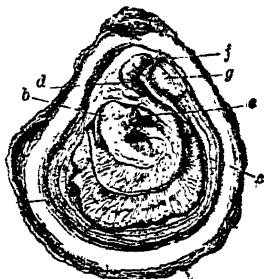
**Oyer and Terminer** (French 'to hear'; 'to determine'), the name given to criminal courts in several States of the United States. In New York and New Jersey the term was abolished in 1895.

**Oyez** (Old French, meaning 'hear ye'), the adjuration sometimes used by court officers at the opening of court, or by criers to preface an announcement or proclamation. In United States courts the English words 'Hear ye' are usually employed.

**Oyster**, (*Ostrea*), a genus of bivalve molluscs comprising over 100 known species. It is the most extensively eaten shellfish, and, next to herring, the most valuable commercially of all food obtained from the sea. The so-called pearl oyster belongs to the marine family Aviculidæ (see PEARL).

The fundamental characteristics are those of other bivalve molluscs; the two valves of

the shell are unequal, the hinge which unites them being without teeth; and the single powerful closing muscle is almost median in position. On an opened oyster it is easy to detect the fringed mantle which lines and builds the shell; the ciliated gills or 'beard'—two



Structure of Oyster.

a, Fringed margin of mantle;  
b, muscle of shell; c, gills; d,  
liver; e, heart; f, mouth; g, labial palpi.

somewhat similar flaps (labial palps) on each side of the mouth, which, overhung by a hood, lie near one end of the hinge; the brownish digestive gland, and the heart and kidneys close beside the shell-shutting muscle.

Many interesting facts are connected with the life history of the oyster. Maturity is sometimes rapidly attained, but usually not until the third or fourth year of life; and the maximum fertility is between the fourth and seventh years. The reproductive season generally begins in May, and continues till early autumn; but its limits are extended or lessened by the conditions of temperature. During this period the oysters of both sexes become emaciated, and are said to be 'out of season,' and as a consequence are generally considered unwholesome. Oysters live gregariously, forming natural 'beds,' 'banks' or 'reefs,' in large conglomerated masses, at depths varying from 15 to 120 ft., and are fastidious as to locality. They also require a peculiar food supply, and a water temperature between  $60^{\circ}$  and  $70^{\circ}$  F. The food consists of microscopic organisms—diatoms, larvæ, and algæ spores—which are washed into the gaping shell and on to the mouth by the ciliary activity of the gills and palps.

The great increase in the consumption of oysters in recent years led to destructive digging to supply the demand, and many of the natural beds have become exhausted. In consequence, scientific cultivation has been re-

sorted to. Specialized oyster fisheries on various plans are now in operation in about thirty-five countries, and considerably more than half of the world's annual crop is taken from these artificial beds. In Puget Sound, on the Pacific Coast, the average temperature of the water is so low that the oyster does not spawn; and the beds are kept up by annual planting of seed oysters, which are brought in immense quantities from Atlantic waters. Many attempts have been made to introduce the American oyster into European waters, but thus far all have failed, owing, it is believed, to the greater salinity of the European seas.

The oyster crop of the North Atlantic greatly exceeds that of all other oyster fisheries combined, amounting to 17,000,000 bushels out of a world total of 22,000,000 bushels. The largest known oyster ground in the world is Chesapeake Bay, with Long Island Sound second. Consult *Bulletins* of the U. S. Fish Commission.

**Oyster Bay**, town, New York, in Nassau co., on an inlet of Long Island Sound. Steamboats ply to New York in summer. It is a fashionable and popular summer resort, containing many fine mansions of New York's aristocracy, and the home of the late Theodore Roosevelt. The peace plenipotentiaries of Russia and Japan met here in 1905; p. 42,594.

**Oyster-catcher** (*Hematopus*), a genus of birds of the family Charadriidae, closely allied to the plovers. The common American species is *H. palliatus*, found in the South Atlantic States and tropical America. It is about 19 inches long and its head, neck, and mantle are black, the other parts mostly white. It lives on shore molluscs and marine worms and lays three or four eggs of a yellowish color, with darker tints. *H. bachmani* is a black species found on the Pacific coast.

**Ozaka**. See **Osaka**.

**Ozanam**, Antoine Frederic (1813-53), French historical writer. He studied at Lyons and Paris, and in 1841 was appointed to fill the chair of foreign literature at the Sorbonne. In 1833 he induced some of his fellow students to join him in visiting and personally serving the poor, thus founding the Conferences of St. Vincent, de Paul, a society which has now spread over the world, and which has become one of the most important organizations of lay Roman Catholics.

**Ozark Mountains**, a plateau region in the Mississippi Valley, averaging about 2,000 ft. in height, which covers the greater part of South-

ern Missouri and Northern Arkansas, and extends into Kansas and Oklahoma. The Ozarks are heavily timbered in the southern portion, and are reputed to be rich in mineral deposits.

**Ozocerite**, also called **Mineral Wax** or **Native Paraffin**, a mixture of hydrocarbons—usually between  $C_{18}H_{38}$  and  $C_{28}H_{58}$  in composition—which is found naturally in Galicia, Turkestan, and Utah. It varies from a transparent, soft, yellow solid to a hard, dark, resinous substance. The solid product, or cerasin, is employed in the manufacture of candles, and mixed with india rubber as an insulating material.

**Ozone**, an allotropic form of the element oxygen, named from the Greek word 'to smell,' gaseous at ordinary temperatures, was first observed by van Marum in 1785, and investigated in 1840 by Schönbein. It is claimed that ozone is present in the air at great heights, on mountains, at the seashore, in forests of pine, and, in general, in regions remote from human habitation—and particularly after thunder storms.

Ozone is found in the oxygen liberated by the electrolysis of water, and can be detected frequently in oxygen set free from its oxides or other compounds. It has a faint blue color, and a strong, characteristic, penetrating odor resembling chlorine. The odor is noticeable near an object which has just been struck by lightning, and in the neighborhood of electrical machines and arc lamps when in operation. The odor commonly attributed to phosphorus is really that of ozone. Ozone is unstable, becoming oxygen slowly at 50° C., and instantaneously at 300° C., 2 volumes yielding 3 of oxygen. The general chemical action is as an oxidizer, and it differs from oxygen chiefly in that it is more active. Many reactions that take place with oxygen only at high temperatures proceed readily with ozone at ordinary temperatures.

Because of its ability to form oxides readily and at ordinary temperatures, ozone is finding an extensive field of application, chief of which is the purifying of drinking water. Large water-purifying plants are already in operation, in more than 40 towns in Europe and America. The water is atomized in the presence of ozonized air, or ozonized air is forced through the water. Ozone is also used for air purification as in theatres, subways, offices, laundries, cold-storage refrigerators, and the like.

**P**, the 16th letter of the alphabet, is the voiceless labial stop; before utterance the breath is cut off by the closing of the lips. Like other stops, it tends to become spirant: *ph* is used as a sign for *f*. It may also change into the voiced labial stop *b*: in modern Greek, for example, it is pronounced *b* after *m* (cf. 'cupboard'). In English *p* becomes silent before certain related consonants ('receipt,' 'pneumatic').  $\pi$ . By this Greek letter is indicated in mathematics the ratio of the circumference of a circle to its diameter, which enters into so many mathematical expressions. The circumference and diameter being incommensurable, the value of  $\pi$  can only be expressed as a never-ending decimal, and the famous problem of 'squaring the circle' is insoluble.

**PA**, Petroleum Administration. A U. S. New Deal agency.

**Paca, William** (1740-99), American politician, born at Wye Hall, on the Eastern Shore of Md. He took the patriot side in the trouble with England, was a delegate to the Continental Congress in 1774-79, and was one of the signers of the Declaration of Independence. He was governor of Maryland from 1782 to 1785.

**Pacaraima, Sierra**, a South American chain running for 280 m. from w. to e., making a water shed between the Orinoco and the Rio Branco, and forming part of the boundary line between Brazil and Venezuela.

**Pacelli, Eugenio** (1876- ), Pope, was born in Rome and educated for the priesthood; a noted scholar speaking nine languages, he rapidly advanced in the diplomatic service of the church. After serving as Nuncio at Munich, he was created Cardinal in 1929, and became papal Secretary of State. He was papal Legate to the 1934 Eucharistic Congress at Buenos Aires, Argentina. In 1936 he visited the United States. As Secretary of State he was long associated with Pope Pius XI., whom he loved and admired, and with whose policies he was closely identified; and upon the death of that Pon-

tiff, he was elected Pope on his 63rd birthday. March 6, 1939, and was enthroned as Pius XII.

**Pachacama**, dept. of Peru. Here are the ruins of an ancient temple 200 yds. long and 150 wide, a cemetery rich in pre-Incan household utensils, an immense adobe convent, and vestiges of tiny huts probably used by pilgrims to the shrines. In 1523 Pizarro sacked the temple. It was the sacred city of the Incas and the earlier Tuncas; p. about 1,300.

**Pachino**, tn., Syracuse prov., Sicily, Italy, 26 m. s.s.w. of Syracuse; has vine-growing and fish-curing; p. (1901) 12,473.

**Pachmann, Vladimar de** (1848-1933), Russian pianist, born at Odessa. He made his first appearance in Russia (1869).

**Pachomius** (c. 292-348). A convert to Christianity, he founded (about 330), on the island of Tabennæ in the Nile, the first institution for the pursuance of a common monastic life, a corresponding institution for nuns being founded by his sister.

**Pachuca**, cap. of state of Hidalgo, Mex. Its site is in a mountain pass at an elevation of 8,150 ft. above the sea.

**Pachydermata**, a term applied by Cuvier to the order of mammals which included thick-skinned forms, such as the rhinoceros, elephant, and hippopotamus. The term has long been abandoned. See UNGULATA.

**Pacific Ocean**. Lying between America on the e. and Asia and Australia on the w., and extending from the Bering Strait southwards to the Southern Ocean in lat. 40° s., the Pacific Ocean is the largest expanse of water in the world, measuring from n. to s. fully 7,000 m., with a maximum breadth of 10,000 m. Its area is 55,624,000 sq. m., or fully 40 per cent. of the total water surface of the globe. Its depth also is great, especially in the N. Pacific, where the mean is about 2,600 fathoms. The Pacific is remarkable for the smallness of its drainage area, which extends over only 7,500,000 sq. m., or not very much more than that of the Indian Ocean. On the western border lie a

number of landlocked seas—the Seas of Okhotsk and Japan, the Yellow, China, Celebes, Sulu, and Banda Seas. The temperature of the water is high in the tropical regions, favoring the growth of coral reef. In the n. the influx of water from the Arctic Ocean produces very low temperatures and gives rise to the cold Californian current flowing down the e. coast. The Pacific was first discovered by Europeans as a separate ocean in 1513, when Vasco Nuñez de Balboa crossed the Isthmus of Panama, and was first navigated by a European vessel in 1520, when Magellan passed through the strait which bears his name, and experiencing calm weather after the storms he had encountered, called the ocean the Pacific. He was followed by Drake in 1578, and toward the end of the century and early in the following one by the Spanish navigators Mendafia and De Quiros. Of later voyagers Cook and Vancouver, towards the end of the 18th century, are the most noteworthy.

**Pacifist**, a term originating in Europe many years ago to denote those persons who stood for world organization and for the final abolition of war. As generally used during and following World War I and II, it has a much narrower significance, being applied specifically to that group of persons who opposed the waging of war for any purpose or under any conditions.

**Packard, Alpheus Spring** (1839-1905), American zoologist, son of Alpheus S. Packard, the educator, was born in Brunswick, Maine. He studied under Agassiz at Harvard and in 1864 visited Labrador and published a valuable memoir on the geology and zoology of that region. From 1877 to 1882 he was a member of the U. S. entomological commission, and for many years was the leading authority in America on agricultural insect pests. He founded and for twenty years edited the *American Naturalist*.

**Packer, Asa** (1806-79), American philanthropist. In 1833, shortly after the opening of the Lehigh Valley Canal, he bought a canal boat and engaged in the coal-carrying business. He subsequently became a coalmine owner, and by 1855 had organized and built a large section of the Lehigh Valley railroad, which he continued to develop, and of which he became president. Of his great wealth he gave large sums for the founding of Lehigh University.

**Packer Collegiate Institute**, a school for girls and young women, in Brooklyn, N. Y., was chartered in 1853 and opened in 1854,

succeeding the Brooklyn Female Academy. It was founded by Mrs. Harriet P. Packer in memory of her husband, William S. Packer, for whom it was named. Its curriculum includes elementary and high school courses, and a two-year junior college course.

**Packet**, a name originally given to any vessel employed by a government to carry mails. It is now applied to any vessel, sailing or steam, trading regularly between ports with goods and passengers.

**Packing Industry.** The meat packing industry includes the slaughter of the various food-producing animals and the preparation of their carcasses to be sold as fresh meats at distant parts, together with the various curing and by-product manufacturing processes carried on in the final disposition of the different parts of the carcass. Prior to the invention of the refrigerator car in 1868 by William Davis of Detroit, fresh meat of necessity had to be killed near the point of consumption thus rendering impracticable the killing of animals at one point in sufficient numbers to supply cities thousands of miles away. From 1868, however, methods in the meat industry began rapidly to change. Chicago took the lead, followed by such cities as Kansas City, St. Louis, South Omaha and others, in which the industry centers today. The packing industry in its broadest sense involves the purchase of live stock, the conversion of the live stock into saleable products, the distribution of the products thus obtained. Live stock handled by packers includes cattle, sheep, and hogs. The animals are shipped in stock cars to the markets that have grown up along with the development of the packing industry, and here the expert buyers employed by the packing companies make their purchases, dealing with the owners directly or carrying out the transaction through live-stock brokers. In the slaughtering of animals the division of labor is carried out to a very fine degree, which renders possible the greatest skill and speed in the work. During the slaughtering the carcasses are inspected by the Federal meat inspectors. The carcasses which fail to reveal conditions which would render the meat unfit for food are marked 'U. S. Inspected and Passed.' The actual slaughtering of the animals is but a small percentage of the work included under meat packing. A large proportion of the cattle carcasses and practically all of the sheep carcasses, barring those used in the local trade, after being properly chilled are packed into refrigerator cars to be forwarded



to the selling agents throughout the country. There are canning and curing processes that make possible the preservation of millions of pounds of beef, pork, and mutton annually. The curing of the products of the hog is a much larger industry than that of beef, as only about 10 per cent. of the dressed carcass is used as fresh meat. The making of lard is also an important division of meat packing.

The utilization of the by-products is where the meat packer displays his greatest ingenuity. Not many years ago a large percentage of these were discarded. Today this is all changed and practically nothing is wasted. About the abattoirs are located various buildings which take care of these products. The hoofs, horns, and bones are made into glue, the hides into leather, the bristles from the hogs are used in brushes and the meat scraps, tankage, dried blood, and ground bone are converted into fertilizer. Tallow, oleo oil, lard oil, and soaps are also made from the trimmings about the head, feet, and other parts. Some valuable drugs are obtained from the various organs, of which thyroid extract from the thyroid gland, pepsin from the stomach, pancreatin from the pancreas, and suprarenal extract from the suprarenal glands are among the most important.

In the United States, in accordance with the Meat Inspection Law, enacted June 30, 1906 and effective Oct. 1, 1906, every meat slaughtering or packing establishment doing an interstate or foreign business must have Federal inspection unless specially exempted. Two classes of inspectors carry on the work. The first grade, or veterinary inspectors, must be graduates of recognized veterinary colleges, and must pass a civil service examination on professional subjects. These men examine the cattle in the yards. The second grade of officials are known as meat inspectors. They must be men of experience in packing-house methods. They secure their appointments through civil-service examination, in the grading of which experience counts 60 per cent. In all abattoirs the sanitary conditions must be carefully looked after, and from time to time expert sanitarians employed by the Government examine the various plants where inspection is carried on, and offer suggestions to better any defects in sanitation. The tendency in the United States has been toward the concentration of the meat packing industry in the hands of a few large companies, beginning

as individual enterprises with comparatively little capital but developing into a powerful combination. The industry has had a long history, in connection with the Sherman Anti-trust Act of 1890, of federal court action against combinations of packers. A Supreme Court injunction of 1903 broke up a combination, and a five-year study by a Federal Trade Commission, ending in 1919, resulted in the 'Packers and Stockyards Act of 1921, which put the whole business under the supervision of the Secretary of Agriculture.

The activities of the Bureau of Animal Industry in meat inspection and in the protection of live-stock from disease are fully reported in bulletins issued at Washington and easily obtainable.

**Pack Saddle**, a saddle especially constructed for the transportation of cargo on the backs of animals. The aparejo, of Arabian origin, which is in use in the U. S. Army, is composed of two rectangular sections of leather sewed all around and across the middle, and clinched to the body of the animal.

**Pact of London**, an agreement entered into on Sept. 5, 1914, by Great Britain, France and Russia, and later adhered to by Japan (Oct. 19, 1915) and Italy (Dec. 1, 1915), whereby those governments mutually engaged not to conclude peace separately during the Great War then in progress. Russia's separate peace with the Central Powers, signed at Brest-Litovsk on March 3, 1918, was in violation of the agreement.

**Paddington**, part of 'Greater London.'

**Paddlefish**, also known as the **Spoon-billed Catfish** and **Spadefish**, a ganoid fish of the Mississippi Valley (*Polyodon spathula*), which is nearly related to the sturgeons, but more closely resembles the catfish in its dark, scaleless skin, mud-digging habits, and food.

**Paddle Steamers**, or vessels propelled by paddle wheels, are of two types, side-wheel and stern-wheel. Side-wheel steamers are largely employed on inland waters, particularly on the rivers, bays, and sounds of the United States. Stern-wheel steamers are used on the rivers of the Mississippi basin and the streams of the Southern States. They are particularly adapted for the navigation of the shallower waters or of rivers whose depth varies greatly with the seasons.

**Paddle Wheel** of a steamer consists of a large wheel having paddles or floats attached to the rim. The wheel is immersed to such a depth that there is about a foot

of water above the floats when in their lowest position.

**Paderewski, Ignace Jan** (1860-1941), Polish pianist and public official, was born in Podolia, Russian Poland. As a boy he showed remarkable gifts for music. He studied at the Warsaw Conservatory and in Berlin. In 1888 he made a tour of Germany; the following year he was heard in Paris, and in 1890 in London. In 1891 he made the first of several successful visits to the United States, where, a few years later, he established a fund of \$10,000 for the encouragement of American composers, the prizes to be awarded every three years. In

he took an active part in the Peace Conference at Versailles. In 1920 he retired to his estate in California. He toured the United States in 1930-1931, and then returned to Poland. He later lived in Switzerland.

**Padua**, province of Venetia, Northern Italy, with an area of 826 sq. m. It is watered by the Rivers Adige, Bacchiglione, and Brenta, and intersected by a network of canals. The surface is a fertile plain, rich in mineral springs. Rice, wheat, wine, silk and hemp are the principal products; p. 634,000.

**Padua**, city, Italy, capital of the province of Padua, on the river Bacchiglione. It has a fine municipal palace, the Palazzo della



*Examining Throat Glands.*

*Making Final Inspection.*

*U. S. Inspection of Meat at the Establishment of Swift & Co., Chicago.*

1902 he produced at the Metropolitan Opera in New York his three-act opera. In 1909 he became director of the Conservatory at Warsaw. Paderewski was universally recognized as one of the greatest of pianists. During the Great War (1914-19) Paderewski was sent to America as plenipotentiary by the National Polish Committee and there labored untiringly on behalf of his oppressed country. In January, 1919, having reached an agreement with General Pilsudski, military dictator of Poland, Paderewski was created Prime Minister of the reconstituted Polish state (see **POLAND**). In this capacity

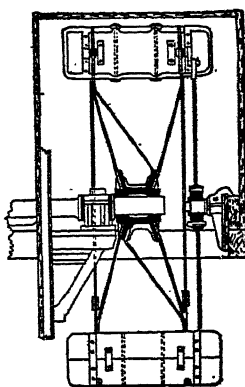
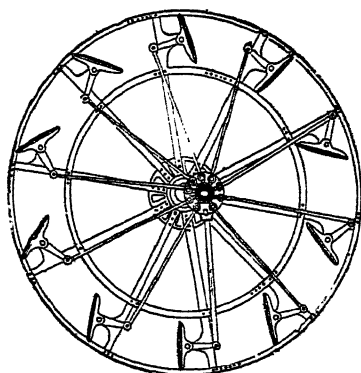
Ragione, built in 1172-1219; and a Cathedral which dates back to 1550. In the Santo Square is Donatello's famous bronze equestrian statue of Gattamelata. Padua has derived her greatest fame from her University, founded by the Emperor Frederick II. in 1221. To it are attached one of the oldest botanical gardens in Europe, an observatory, and a library (1629) of 200,000 volumes. Padua, the ancient Patavium, was the birthplace of Livy, and an important Roman commercial center. It was destroyed by Attila in 452. The French occupied it in 1797; and from 1814 to 1866 it belonged to

Austria. During the World War it was bombed by Austrian aircraft (1917-1918); p. 125,200.

**Paducah**, city, Kentucky, county seat of McCracken county, is situated at the confluence of the Ohio and the Tennessee Rivers. Steamboats ply to points on the Ohio, Tennessee and Cumberland Rivers. Paducah is situated in a rich agricultural region, producing live-stock, corn, wheat, oats, hay, and tobacco, and is a shipping point for strawberries and other small fruits. It is one of the largest dark tobacco markets in the United States, as well as an important jobbing center. In 1861 General Grant erect-

ed the patriots, and with a small force of cavalry defeated the Spaniards at Mata de la Hiel (1816). On the resignation of Francisco Santander he became supreme political and military chief. After defeating the Spaniards at Yagual and Mucuritas, he recognized the authority of Bolivar, who made him his general-in-chief. His capture of Puerto Cabello secured the independence of Columbia. After the failure of a federal system, Venezuela seceded, and Paez became president (1830). He was president a second time in 1839-42.

**Pagan**, town, India, in the district of Myingyan, Upper Burma. Until 1284 Pagan



*Feathering Paddle Wheel.*

ed defensive works here, and in 1864 the city withstood an attack by Confederate forces; p. 33,765.

**Pæan**, in ancient Greek mythology, the physician among the gods. Later the name was used in the more general sense of a deliverer, and given particularly to Apollo. As a common noun the word is applied to a hymn, especially a hymn of thanksgiving for deliverance, sung first in honor of Apollo, but later of other gods also.

**Pæstum**, anciently a Greek city of Lucania, in Southern Italy, on the present Gulf of Salerno. Portions of the ancient walls and three well-preserved Doric temples remain. Modern excavations have disclosed a theater, a city gate, and two great roads which crossed the city from opposite directions.

**Paez, José Antonio** (1790-1873), Venezuelan soldier, was born in Acarigua, Barinas. When the independence of his native country was declared, in 1810, he joined the ranks

of the patriots, and with a small force of cavalry defeated the Spaniards at Mata de la Hiel (1816). On the resignation of Francisco Santander he became supreme political and military chief. After defeating the Spaniards at Yagual and Mucuritas, he recognized the authority of Bolivar, who made him his general-in-chief. His capture of Puerto Cabello secured the independence of Columbia. After the failure of a federal system, Venezuela seceded, and Paez became president (1830). He was president a second time in 1839-42.

**Paganini, Niccolò** (1784-1840), Italian violinist, was born in Genoa, Italy. He began professional tours in Italy in 1805, and in 1831 created a *furor* in Paris and London. His influence may be said to have created the modern brilliant school of violin playing, and the performance of his concertos and caprices is still regarded by violinists as the supreme test of technical proficiency.

**Pagan, Curtis Hidden** (1870- ), American author and educator, professor of Romance languages at Columbia University (1895-1909). From 1909 to 1911 he was professor of English literature at Northwestern University; and after 1911 professor of English at Dartmouth College. He edited *British Poets of the Nineteenth Century* (1904; revised 1911); *The Chief American Poets* (1905; revised 1912). His translations include *A Voyage to the Moon*, by Cyrano de

Bergerac (1899), *Songs and Sonnets of Ronsard* (1903); *The Best Plays of Molière* (2 vols. 1907; 7 vols., 1911-13), and Anatole France's *The Man Who Married a Dumb Wife* (1915). He wrote a *History of Japanese Poetry*, with 235 translations.

**Page, John** (1744-1808), American patriot, accompanied Washington in one of his expeditions against the French and Indians in the colonial wars. On the outbreak of the Revolutionary War he rendered distinguished service, expending his private fortune for public ends. He was made governor of Virginia in 1802.

**Page, Thomas Nelson** (1853-1922), American diplomat and novelist, was born in Oakland Plantation, Hanover county, Va. He was educated at Washington and Lee University and the University of Virginia; and after practising law for a time (1875-93) in Richmond, devoted himself to writing and lecturing. In a number of short stories and tales he has given a faithful picture of life in the South before, during, and after the Civil War. In 1884 'Marse Chan' appeared in *The Century Magazine*, and at once attracted much favorable attention. This and other short stories were published in 1887 under the title *In Old Virginia*. Subsequent publications include *Two Little Confederates* (1888); *The Old South* (1891), social and political essays; *The Old Gentleman of the Black Stock* (1897); *Social Life in Old Virginia Before the War* (1897); *Red Rock* (1898), a novel of the reconstruction period; *Gordon Keith* (1903); *Bred in the Bone and Other Stories* (1905); *John Marvel Assistant* (1909), a novel; *Robert E. Lee, Man and Soldier* (1911); *The Land of the Spirit* (1913); *Italy's Relation to the War* (1920); and various books for children. From 1913 to 1919 he served as U. S. Ambassador to Italy.

**Page, Walter Hines** (1855-1918), American diplomat and editor, was born in Cary, N. C. He was graduated from Randolph-Macon College (1876). After serving for some years on the editorial staff of the *New York Evening Post*, he became manager of *The Forum* in 1889, and was its editor from 1890 to 1895. From 1896 to 1899 he was editor of *The Atlantic Monthly*. He then became one of the founders of the publishing house of Doubleday Page & Co., and was editor of its magazine *The World's Work* from 1900 to 1913, when he succeeded Whitelaw Reid as U. S. Ambassador to Great Britain. This position, peculiarly difficult on account of

the Great War, he filled with unusual tact and skill. He published besides many articles, *The Rebuilding of Old Commonwealths* (1902) and *The Southerner* (1909). Consult Hendricks' *Life and Letters of Walter H. Page* (1922).

**Page, William** (1811-85), American artist. He spent the years 1849-60 in Rome, and was an intimate friend of the Brownings, whose portraits he painted. He was president of the National School of Design in 1871-3. In addition to numerous portraits he painted *Farragut at the Battle of Mobile* (presented to the Czar of Russia); a *Holy Family*; *The Young Merchants*.

**Paget, Violet** (1856-1935), British essayist, novelist, and poet, better known under her pseudonym, 'Vernon Lee.' Her works include: *Studies of the Eighteenth Century in Italy* (1880); *The Spirit of Rome* (1905); *The Sentimental Traveller* (1907); *Gospels of Anarchy* (1908); *Beauty and Ugliness* (1911); *Louis Norbert* (1914); *Satan the Waster* (1920); *The Handling of Words and Other Studies in Literary Psychology* (1923). *The Golden Keys* (1925); *Music and Its Lovers* (1932).

**Pagoda**, a temple or sacred edifice. In India the term is applied only to the pyramidal structure erected above the entrance or above the sanctuary within. The Chinese brick-built pagoda is not connected with a temple or place of worship, but is usually erected as a memorial. It is often octagonal, tapering, and rising many stories.

**Pago-Pago**, or **Pango-Pango**, seaport on the s.e. coast of Tutuila, Samoan Islands, Pacific. It has the only good harbor in Samoa. In 1872 it was ceded as a coaling and naval station to the United States, which subsequently acquired sovereign rights over all Tutuila.

**Pahang**, the largest of the federated Malay states, on the east coast of the Malay Peninsula, with an area of about 14,000 sq. m. It has been under British protection since 1888. It produces tin, gold, and rubber.

**Pailleron, Edouard** (1834-99), French dramatist, was born at Paris. Two very able comedies, *Le Monde où l'on s'amuse* (1868) and *Les Faux Ménages* (1869), secured his reputation, which reached its climax with *Le Monde où l'on s'ennuie* (1881).

**Pain** is one of the fundamental aspects of feeling-tone. The sensations of the higher senses are frequently almost, if not entirely, neutral. Feelings vary in painfulness from the lowest perceptible unpleasantness to the

most acute and overwhelming pain. There are certain well-marked classes of pain—stabbing pains, burning, throbbing, massive, acute, stinging, and so on. The descriptive terms are, as a rule, taken from physical modes of causing pain. They indicate generally that pain is the result of the serious interruption of function. Physiologically, pain is concomitant with a decrease in some of the vital functions. As a symptom it is of the highest diagnostic value; for wherever a lesion may be, whether at the periphery or the center, it is always referred to some spot.

**Paine, Albert Bigelow** (1861-1937), American author, was born at New Bedford, Mass., and being taken West received a public school education at Xenia, Ill. In 1879, he removed to St. Louis, where he learned portrait-drawing and photography. In 1895 he removed to New York city, and was engaged in various newspaper and syndicate enterprises until 1898, when he became editor of the N. Y. *Herald's* children's page. From 1899 he was a member of the staff of *St. Nicholas*. His numerous books include *The Arkansaw Bear* (1898), *The Bread Line* (1900), *The Great White Way* (1901), *The Commuters* (1904), *The Lucky Piece* (1906), *The Hollow Tree Snowed-in Book* (1910), *Mark Twain, a Biography* (1912), *The Boy's Life of Mark Twain* (1916), *Mark Twain Letters* (1917), *The Car That Went Abroad* (1921), *In One Man's Life* (1921), *Joan of Arc* (1925), *Life and Lillian Gish* (1932), *Gold Cat* (1934).

**Paine, Charles Jackson** (1833-1916), American soldier and yachtsman. He engaged in railroad enterprises and acquired a large fortune, served with distinction in the Civil War, and later took up yachting, being part owner of the *Puritan* and full owner of the *Mayflower* and the *Volunteer*, all three of which vessels were successful in races with British yachts for the America's cup.

**Paine, John Knowles** (1839-1906). An American composer and teacher. In 1872 he became an instructor in music at Harvard University, and in 1876 professor of music, a chair created for him. His compositions include several symphonies, one of which, entitled *Spring*, has been played many times in New York and Boston; incidental music for the *Cedipus Tyrannus* of Sophocles; overtures for *The Tempest* and *As You Like It*; the Centennial Hymn to Whittier's words sung at the opening of the Philadelphia exposition in 1876, the *Columbus March* for

Chicago in 1893, and the *Hymn of the West* for the opening of the St. Louis exposition in 1904; a mass, an oratorio, St. Peter, and several cantatas.

**Paine, Robert Treat** (1731-1814), American politician, born at Boston. From 1774 to 1778 he was a member of the Continental Congress, and was one of the signers of the Declaration of Independence. From 1780 to 1790 he was attorney-general of Massachusetts, and was judge of the Supreme Judicial Court from 1790 to 1804.

**Paine, Robert Treat** (1835-1910), American lawyer and philanthropist, great-grandson of R. T. Paine (1731-1814), was born in Boston. In 1879 he organized the Wells Memorial Workingmen's Institute, of which he became president, and he was an officer of other workingmen's beneficiary associations.

**Paine, Thomas** (1737-1809), American political agitator and writer, was born in Thetford, England. His father was a Quaker, and his early religious training was in accord with the views of that sect. On the advice of Franklin he decided to go to America, and shortly sailed for Philadelphia, arriving Nov. 30, 1774. The revolutionary agitation, then rapidly approaching its crisis, offered a fertile field for Paine's talents. For about a year and a half he was editor of the *Pennsylvania Magazine*, the publication of which began in January, 1775, and a frequent contributor to its pages. In January, 1776, the publication of *Common Sense* made him for the moment the best known and most influential writer in America. Authorities are agreed in ascribing to *Common Sense* the principal credit for turning the scales in favor of independence. In December appeared the first number of the *Crisis*, beginning with the famous words, 'These are the times that try men's souls.' On April, 17, 1777, he became secretary to the committee of foreign affairs of the Continental Congress. In the controversy between Congress and Silas Deane, Paine took the side of Congress, and attacked Gouverneur Morris, who supported Deane. As a consequence, he was removed in January, 1779, from his secretaryship. In 1784 New York presented him with a confiscated estate of 277 acres at New Rochelle, where his monument now stands. The appearance, in November, 1790, of Burke's *Reflections on the French Revolution*, called out a rejoinder from Paine under the title of *The Rights of Man*, in which the principles of the revolution were defended and the influence of American ex-

ample set forth. The book was dedicated to Washington, was translated into French, and made a great impression. The British Government undertook to suppress it. In December, 1792, Paine was tried for high treason in the court of king's bench. He was ably defended by Erskine, but he was convicted and outlawed. He had already gone to France, where he was on the committee which drafted a new constitution for France. On Dec. 27 he was arrested by order of the Committee of Public Safety, and confined in the Luxembourg prison, where he remained until Nov., 1794.

The first part of Paine's third great work, the *Age of Reason*, was published in 1794. It was this work that caused Paine to be branded as an atheist. He returned to the United States in the fall of 1802, where he died in New York June 8, 1809. In 1945 his name was added to the Hall of Fame in New York.

**Painesville**, city, Ohio, county seat of Lake County, on the Grand River, a residential city and the site of Lake Erie College. It is situated in a rich and productive farming district. Considerable commercial importance attaches to Painesville, because of its proximity to Fairport, on Lake Erie, where there is a good harbor; p. 12,235.

**Painted Desert**, the name given to the plateau in Arizona included between the cañons of the Marble and Colorado Rivers. It is so-called because of the remarkable coloring of the rocks.

**Painted Lady**. See *Vanessa*.

**Painting as a Fine Art**. Painting is the process of applying pigment to a surface. Application by means of a brush is usually implied; but the term has now been broadened to include application by means of an air brush (a fine spray). Artists refer to their work as painting when the pigment has been applied with a pallet knife.

In the early days of Art, desire for expression and a germinating love of beauty were evidenced by very simple decorations of implements and crude pictures which have come down to us on walls. In Assyria, India, Egypt and China decorations of the temples and portrayals of the deities assumed a foremost place. A refined sense of beauty of line and action began to show itself in Egypt and particularly in Greece. Wall paintings of the Middle Ages in Europe during the Romanesque and early Gothic periods are filled with evidences of sincere and sometimes of inspired feeling. At

the time of the Renaissance an intellectual quality began to make itself known, more and more infused with a love of beauty. Most of Raphael's work shows tremendous skill, knowledge of composition, ability in balancing color masses and charm of line but it has only a minor infusion of what is spiritual or exalted in feeling. Leonardo da Vinci, the most refined of technicians, added a still higher intellectual quality. In the *Mona Lisa* one feels a searching for the character of the being behind the exterior shell. The later Renaissance turned more and more to an expression of beauty. The early primitives in Holland showed the same spiritual qualities that were found in Italy and seen in Giotto's frescoes but with the full swing of the Renaissance under-way in the Netherlands, such painters as Rubens seem to have lost touch with the spiritual and although Van Dyck was a more intellectual painter, it is only in a few compositions that one feels a search for the deepest elements of human life. Hogarth, the father of painting in England, was a seeker after character. Velasquez, the great master among the Spanish painters, and Rembrandt, the greatest of the Dutch, were at all times spiritual surgeons, probing the hidden souls of their subjects, and yet unrivaled in technique. The Spanish Murillo stands in sharp contrast to Velasquez, in that the predominant effort in all his work was to paint something beautiful. The great painters of the Renaissance in England, Sir Joshua Reynolds, Gainsborough, Romney and others of the period, painted wonderful portraits of the upper classes and aristocracy, depicting characters; but equally interested in depicting clothes and in the composition of their pictures. A similar tendency was to be found in France. Le Brun composed court pictures and battle scenes for Louis xiv. and under Louis xv. Boucher, Watteau and Lancret showed the same mastery of color and form coupled with a charming but superficial expression of the gaieties of the court.

In the 18th century, the Spanish painter, Goya, evinced a rather cynical quality exaggerating the portrayal of character; but showing a disregard of beauty. In France, Chardin, keenly sensitive to beauty, also interested himself in the depiction of character as he found it among the homely scenes of the middle classes. After this, during the early part of the 19th century, in practically all countries, a somewhat sterile period developed, in which pursuit of the

formalities of composition and very great skill in draftsmanship smothered more spiritual qualities. A group of painters in England under Rossetti and Holman Hunt, who styled themselves the pre-Raphaelites, revolted against this, and a similar crusade was formed in France under the painters of the Barbizon school. Millet, the greatest of the Barbizon painters, depicted the sorrows and hopes of the peasant. In fact, a greater desire for what is real was shown by these Frenchmen than by the symbolical disciples of the pre-Raphaelites. Corot, the poet of painting, ran parallel to the Barbizon school. Courbet and Manet were vital leaders of new searchers for truth. Whistler, an American, who spent most of his life in England and France was one of the masters who insisted on probing for character although he had a greater regard for beauty than Manet. Toward the end of the 19th century a new school developed, largely in France under Claude Monet, Pissaro, Sisley and Seurat who tried to give the effect of sunlight and atmosphere, maintaining that the impression of a scene was the vital element, from which came their name of *Impressionists*. Finding that small areas or spots of pure color, placed close together, gave a more vivid impression than if they were thoroughly mixed before application to the canvas, they resorted to this means of suggesting the vibration of light. As the 19th century drew to a close, there developed an attitude toward art quite at variance with former traditions. Originally, the underlying motive in painting and in sculpture as fine arts had been portrayal. The insurgents held that portrayal was unessential, some maintaining that it detracted from the highest expression of emotion and hindered the reception of the idea, exciting reactions of lesser importance: interest in a story, delight in beauty, a sensuous reaction, even an intellectual preoccupation with and speculation about the character of the subject. The first of the radical groups styled themselves *Independents*, and held the 'Salon' of the *Independents* each year in Paris. They were followed by the *Symbolists* and *Cubists* and now by succeeding generations who each call themselves *Modernists*. Cézanne, Matisse, and Gauguin are perhaps the best known of those who broke away from the old communion. An intentional lack of correct depiction of form, values, atmosphere or color marks all of their work. If muscles interfere with the sweep of a line, muscles are omit-

ted. In the most exaggerated excursions in this direction there is no picturing of objects and the compositions rely on awakening the emotions of the observer by rhythmically placed spots of dark and light notes or by interweaving masses of colors. While the Renaissance was in full swing in Europe, Persia, Arabia, India and in the Far East, China and Japan were developing characteristic expressions of their civilization in masterly expressions of the art of painting that have continued, particularly in Japan, until the present day. The tendency in Eastern art is toward the decorative and much of it is more or less governed by convention.

*Mechanics of Painting as a Fine Art.*—*Fresco*: Pigments, usually derived from the more lasting earth colors which better withstand the action of lime, are mixed with water and painted on a freshly laid plaster surface (*buon fresco*) or on re-dampened plaster (*fresco secco*). The former is more durable, but more difficult, as the day's work must be finished at one time. The best effects can not be obtained by retouching. Because of the difficulty of execution, this method is practised but little at present. Notable frescoes painted recently include the mural decorations for the Detroit Museum of Art by Diego Rivera (Mexican), and the series at Dartmouth College by Orozco (Mexican) depicting 'The Epic of Culture in the New World'. See RIVERA. *Tempera*.—The colors are mixed with a gumlike adhesive medium and the mixture, thinned with water, is usually applied with a brush. Modern tempera colors are manufactured with perfected binding materials that do not deteriorate. All tempera colors are opaque. *Tempera* is not much used for mural subject painting although calomine, really a species of tempera paint, is employed in interior decoration and will be described later. *Oil*.—The use of a drying oil as a vehicle to make pigments adhesive dates from the 14th century. At present linseed oil is the medium chiefly employed, although other vegetable oils are also good. Oil painting is usually on canvas. Surfaces on which paint is to be applied may be divided into two broad categories, *absorbent* and *non-absorbent* or *prepared*. The former draw in the oil and unless the layer of paint is very thick make it possible to paint over the surface in a short time. Non-absorbent surfaces remain wet longer and fresh paint can be mixed into the original application more easily. It seems to be generally agreed that paint-

ings are more lasting if each part is painted at one time unless the underlying coats are allowed to become quite hard before succeeding coats are applied. In painting, the term *value* is applied to the difference in lightness or darkness of differing elements of the painting. *Color* and local color are terms used to denote pureness or intensity of the color of any element. *Atmosphere* and *tone* describe the qualities that bind the different parts of a painting together. The term *high in key* is used for painting in which the relative values of each part may be accurately depicted but in which no dark notes are introduced, while a painting in a *low key* may be just as accurate but the whole regulated to a darker scale. Oil paints change color in drying and become dull. In order to protect them and bring out their color, the surface is usually varnished. There are two kinds of varnish, *permanent* and *retouching*. Both should be colorless. *Water Color*.—Originally water color paints were made in hard cakes or sticks and the artist was obliged to rub the brush over the cakes repeatedly or *grind* the color by rubbing the stick or cake in a saucer containing a little water. Moist colors are now sold in tubes or china pans and children's colors in tin boxes. Many methods are used to keep the colors moist.

*Famous Painters of Different Periods.—Medieval; Early Italians:* Cimabue, Giotto, Orcagna, Fra Angelico. During the Renaissance in *Italy*: Perugino, Lippo Lippi, Botticelli, Ghirlandaio, Fra Bartolommeo, Verrocchio, Leonardo da Vinci, Michelangelo, Andrea del Sarto, Raphael, Andrea Mantegna, the three Bellinis, Giorgione, Titian, Tintoretto, Veronese, Corregio, Guido Reni, Salvator Rosa.

In *Flanders and Holland*, the van Eycks, Rubens, Van Dyck, Teniers, Cuyp, Franz Hals, Ruysdael, Hobbema, Van der Velde, Jan Steen, and Rembrandt. Holbein was the great *German* painter of the Renaissance; Albrecht Durer is known through his drawings. *France* produced Nicholas Poussin, Claude Lorraine, Charles le Brun, Nattier, Watteau, Lancret, Boucher, Madame Vigée le Brun, Chardin. Hogarth was the founder of *English* painting. After him came Sir Joshua Reynolds, Gainsborough, Romney, and Constable. Pacheco, Ribera, Zurbaran and Valesquez (the greatest painter of Spain) lived during the first half of the 17th century and were followed by Murillo and Goya.

Prominent English painters of the 19th

century were Blake, Turner, Holman Hunt, Rossetti, Burne-Jones, Watts, Landseer, Millais, Alma Tadema, Peacock. Whistler, an American, lived in France and England. In France during the 19th century famous names are Millet, Daubigny, Diaz, Corot, Delacroix, Delaroché, Manet, Rosa Bonheur, Meissonier, De Neuville, Puvis de Chavannes, Bonnat, Benjamin Constant, Bouguereau, Laurens, Degas, Monet, Pissaro, Jules Breton, Dagnan-Bouveret, Courtois, Boutet de Monvel, Raffaelli, Daumier. The modern movement numbers Cézanne, Matisse, Renoir, Gauguin, Derain, Picasso, Van Gogh, Henri Rousseau, and Bonnard.

Holland and Belgium produced Israëls, Mauve, the three Maris, Neuhuys, Breitner, Van Looy, Boulanger, Marie Collaert, Courtens, and Verstraete. Modern Spanish art has contributed Mariano Fortuny, Pradilla, Gaudara. During the 20th century two Spanish painters have come to the front, Joaquin Sorolla y Bastida and Ignacio Zuloaga.

In America, art in general has been much swayed by that of Europe. The earliest influence came from England, later from France. The early painters were Copley, Benjamin West, C. W. Peale, Trumbull, Gilbert, Stuart, Vanderlyn, Rembrandt Peale and Sully, all born in the 18th century but finishing their life work in the 19th. During the 19th and early 20th centuries the following are artists of outstanding ability: Thomas Cole, F. E. Church, Bierstadt, Thomas Moran, Daniel Huntington, William Morris Hunt, George Fuller, Winslow Homer, Eastman Johnson, Elihu Vedder, John La Farge, George Innes, Wyant, Homer Martin, Whistler, Sargent, Thomas Eakins, Ryder, Edwin A. Abbey, William M. Chase, Robert Blum, Will S. Low, Thomas Dewing, Abbott Thayer, Kenyon Cox, John W. Alexander, George de Forests, and Birge Harrison, Walter Gay, Mosler, Seymour, Gthomas, Swain Gifford, Coleman, Tryon, Murphy, Dewey, Alden Weir, Twachtman, Blakelock, Mary Cassatt, Cecelia Beaux, George Luks, Bruce Crane Simmons, Shannon, Emil Carlsen, Childé Hassam, Johansen, Ben Foster, Howard Butler, Ernest Lawson, Harry Watrous, Carlton Chapman, Gifford Beal, Paul Dougherty, Tabor Sears, Augustus Vincent Tack, Bellows, Arthur B. Davies, Daniel Garber, Jonas Lie, John Marin, Georgia O'Keeffe, John Sloan, Rockwell Kent, Ezra Winter, and Eugene Savage, and Louis Eisshemius.

For the history of painting consult Woltman and Woerman's *History of Painting*;



Vandyke's *History of Painting*; Muther's *History of Painting*; Champlin and Jerkins' *Dictionary of Painting*; Bryan's *Dictionary of Painting*; Vasari's *Lives of the Most Eminent Painters, Sculptors and Architects*; J. A. Symonds' *The Renaissance in Italy*; H. J. Wilmot Buxton's *German, Dutch and Flemish Painting*; Charles Blanc's *Histoire des peintres de toutes les écoles*; W. C. Brownell's *French Art*; E. Chesneau's *English Schools of Painting*; John Ruskin's *Modern Painters*; William Sharp's *Progress of Art in the Nineteenth Century*; Caffin's *American Masters of Painting*; Isham's *History of American Painting*; Frank Jewett Mather Jr.'s *History of Italian Renaissance Painting* (1923).

For modern art consult J. Maier-Graefe's *Modern Art*; Sheldon Cheney's *A Primer of Modern Art*; Stephen Bourgeois' *The Adolph Lewisohn Collection of Modern French Paintings and Sculpture*; Emile Faure's *L'esprit des formes*; Jan Gordon's *Modern French Painters* (1922); J. Einstein's *Die Kunst des XXten Jahrhunderts* (1826); D. Phillips' *A Collection in the Making* (1926).

In the present-day "American School" of artists there are four groups. The first interprets city life; the second depicts industry—the Left Wing using pigment, the etcher's needle and the lithographer's pencil, often bitterly and tragically, for the proletariat;—the third translates the nation's landscape; and the fourth is a fearless group of Midwesterners—the core of the "American School"—headed by Grant Wood (1892-1942), Thomas Benton, and John Curry of Kansas, all intensely nationalistic and thoroughly Anglo-Saxon.

Wood identified himself with the fourth school by his "American Gothic" which satirizes the Iowa farmer; Benton, by his mural and easel paintings of agricultural and industrial subjects, inculcates into his work symbolic power, truth of characterization and strength of form. Curry strives for vigorous illustrative power, and although his colors are often criticized as crude, brilliancy of idea and force of action are clearly perceptible. He also stresses the more exciting scenes in the life of the South and the West.

In Italy considerable impetus was given to Italian painting, mosaics, stained glass and tapestry by the coöperation and encouragement of the Fascist Government. Because of this driving force, the pure values of color and form were no longer the sole content. Instead, the depiction of people, objects and sur-

roundings were presented for the meaning which they had in regard to the subject and composition of the work. Felice Casorati, a painter of Turin, has produced many works of marked personality; in Venice Guido Cadorin has revived mosaic art; and in Rome Ferruccio Ferrazzi has brought new life to the art of tapestry.

In the United States a most significant venture in the field of art education is the Owatonna Art Education Project, Minnesota, which is intended to impress upon the mind that, for every person, art is inextricably bound up with normal living. Another important experiment is being conducted at the Cincinnati Art Museum, where the student is submitted to a three-year course in which he has the advantage of working with original material.

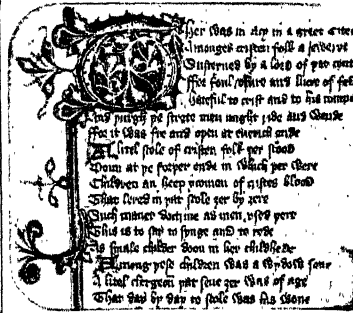
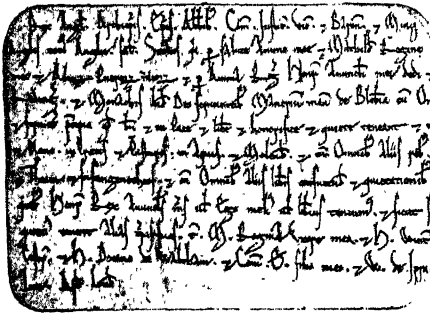
the w. with the new town on the e. The town is the site of a Cluniac priory, raised to an abbey (1219), burned by the English (1307) and rebuilt between 1445-1525. The linen, lawn, and silk-gauze industries, important during the 18th century, are now extinct; as, too, are the 'Paisley shawls,' so celebrated between 1805 and the middle of the century. The manufacture of linen sewing-thread has been nearly superseded since 1812 by that of cotton thread, which has assumed gigantic proportions; p. 87,000.

**Palace**, originally the name for a building used for the residence of the sovereign, but later it came to be applied to the official residence of any person high in authority, such as a prince or bishop, or to any important official building such as the Palace of Justice.

The earliest surviving book mss. in Latin have been found in the ruins of Herculaneum, and are written in what we now call capital letters. See E. M. Thompson's *Handbook of Greek and Latin Palæography* (2d ed. 1894), the best English introduction to the subject.

**Palæolithic Period.** See **Stone Age**.

**Palæologus**, a family which reigned as emperors of Byzantium from 1260-1453. **MICHAEL VIII.** (reigned 1260-82).—**ANDRONICUS II.** (1282-1328).—**ANDRONICUS III.** (1328-41).—**JOHN VI.** (1355-91).—**MANUEL II.** (1391-1425).—**JOHN II.** (1425-48).—**CONSTANTINE XIII.** (1448-53). The last named reigned by permission of the Turkish sultan, Murad II., but in 1450 was opposed by Mohammed II., and was killed at the siege of



*Palæography.*

Left, Grant from King Stephen, 1136-9; Right, Chaucer's *'Canterbury Tales.'*

**Palæography**, that department of historical science which treats of ancient writing. The materials and instruments used in writing, the procedure of the scribe in the practice of his art, and the form and arrangement of mss. and written documents may all be assigned to this department of study. But the subject of primary importance to the palæographer is the history of the written characters themselves. The study of palæography is of great practical importance to criticism and to history in most of its branches. Every country and system of handwriting has a palæography of its own. In most of the countries of Europe, the most important systems of writing have been those which employ the Greek and Latin alphabets. The national handwritings of Western Europe are a part of the material of Latin palæography, for the Latin alphabet was borrowed and adapted to the use of the Teutonic, Celtic, and Romance languages.

Constantinople in 1453.—**ANDREW**, the last Palæologus, son of Thomas, ruler of the Morea, after the overthrow of his father, became a Mohammedan at Constantinople about 1533. His sister or his cousin married Ivan III. of Russia.

**Palæontology**, the study of extinct forms of life. There are two natural subdivisions—palæozoology, relating to extinct animals, and palæobotany, relating to extinct plants. The fossils which the palæontologist has to study are always more or less fragmentary and incomplete. But the matrix can be removed by delicate chisels where it conceals any portion of the bone or shell. Bones are often worked out of the stone in which they were found, so that their whole surface can be examined, and skulls may be pieced together from their scattered fragments. Many fossils have a very restricted time-range, and are found in only a small thickness of strata. Hence lists of the fossils obtained from a bed

often enable the geologist to fix with great precision the age of the rocks from which they come.

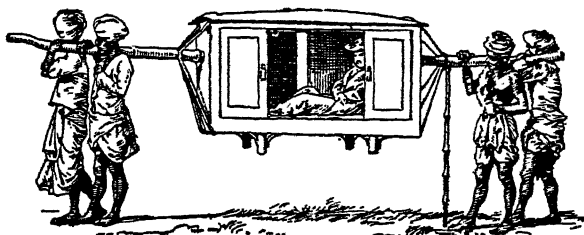
**Palæotherium**, a genus of fossil mammals belonging to the ungulates. Of living animals it resembled most closely the tapir.

**Palæozoic**, the earlier fossiliferous geological systems up to and including the Permian. They rest upon the Archæan (Precambrian), which contain no fossils, and are succeeded by the Mesozoic. The term means ancient life.

**Palamedes**, in ancient Greek legends, was the prince of Nauplia in Argos, and one of the heroes who sailed against Troy, among whom he rivalled Odysseus in craft and wisdom. Odysseus accused him of treacherously communicating with the Trojans, and he was stoned to death.

and it has an area of 2,289 sq. m., and a population of 931,755. In 1156 the Emperor, Frederick I. gave to his half-brother Conrad the palatinate of the Rhine. Conrad formed a state which had Heidelberg for its capital. In 1623 Frederick V. lost all his dominions after his defeat at the White Hill, Prague, and they were given with the electoral dignity to Maximilian of Bavaria. In 1648 the Rhenish or Lower Palatinate was restored to Frederick's son, but Bavaria retained the Upper Palatinate. In the end of that century the Lower Palatinate was cruelly devastated, and Heidelberg burnt by the French. The Bavarian elector in 1815 received most of the Lower Palatinate, the remainder going to Prussia, Hesse-Darmstadt, and Baden.

**Palatine**, originally a court or state official, who was in immediate attendance on the



*Palanquin.*

**Palanquin**, or **Palki**, a kind of litter used in India for the conveyance of travellers. It is of wood, in shape like an oblong box, and has movable sides. Its size allows the traveller to lie down or to sit up. It is carried by four bearers, by means of two poles passed through rings attached to the palanquin.

**Palate**, the roof of the mouth, is divided into the hard palate in front and the soft palate behind. The hard palate arches over to meet the gums in front and on either side, and is formed of periosteum, covered by mucous membrane. The back part of the soft palate hangs free, curving downwards and backwards. The palate is liable to congenital deformity, known as cleft palate.

**Palatinate**, The, consisted originally of the Upper Palatinate, with Amberg as its capital, which now forms the Bavarian district of the Upper Palatinate and part of Upper Franconia, and the Lower or Rhine Palatinate on both sides of the Upper Rhine. The present Palatinate (Ger. *Pfalz*) is the district of the Free State of Bavaria on the left side of the Rhine. Its capital is Speyer,

king; and these counts of the palace, as they were called, held lands as the reward of their services. Their lands were known as 'palatinates,' or 'counties palatine.' The most notable was the Rhine Palatinate (see above). There were three counties palatine in England—Chester, Durham, and Lancaster.

**Palatine**, the earliest inhabited of the seven hills on which ancient Rome stood, its foundation being attributed to Romulus.

**Palawan**, or **Paragua**, the most southwestern of the larger islands of the Philippine group, lies between the China and the Sulu Seas, n.e. of Borneo, and has an area of 4,027 sq. m. With the Calamianes, Dumarán and the Balábec group, it constitutes the province of Palawan (area 5,238 sq. m.).

**Palazzo Vecchio**, a famous building in Florence, Italy, the seat of the Signoria, the government of the republic, until 1532; then the residence of Cosimo I. (1540-50); and since 1871 used as a town hall. It has a slender tower over 300 ft. in height, and the halls are profusely decorated with frescoes by Michelangelo, da Vinci, Vasari, and others.

**Pale**, in Irish history, means that portion of the kingdom over which the English rule and English law was acknowledged.

**Palencia**, province, Central Spain, extends from Biscay Mountains on the n. to the valley of the Douro. Area 3,256 sq. m.; p. 194,886. The capital is Palencia, an ancient walled city, the seat of a fine Gothic cathedral, and a center for the manufacture of shawls and blankets; p. 16,000.

**Palenque**, village, state of Chiapas, Mexico; 70 m. s.e. of San Juan Bautista. About 7 m. s.w. of the village are the superb ruins of the ancient city which bore the same name. These ruins extend over 20 to 30 acres in the midst of a dense tropical forest.

**Paleography**. See **Palæography**.

**Palermo**, city, province of Palermo, capital of Sicily, and the military, ecclesiastical, and judicial headquarters of the island, is situated on the west side of the Gulf of Palermo; 144 m. w. of Messina. It is beautifully situated in the fertile plain of the Conca d'Ora, encircled by an amphitheatre of mountains. Buildings of special interest are the Palazzo Reale, of Saracenic origin the Cappella Palatina (1132), adorned with exquisite mosaic decorations, sometimes said to be the most beautiful palace-chapel in the world; the church of San Giovanni degli Eremiti, a 12th century edifice; the Palazzo Sclafani, built in 1330, now serving as barracks; the cathedral, completed in 1185 and added to in the 14th, 15th, and 18th centuries. The beautiful Garden Garibaldi contains an unsurpassed collection of rare trees.

The chief products of the city are sulphur, wines, sumach, oranges, olives, and lemons, all of which are exported, constituting a constantly increasing commerce. Palermo, the ancient *Panormus*, was founded by the Phœnicians, and in 254 B.C. was occupied by the Romans, who made it a principal naval station. In 1860 it was liberated by Garibaldi, and was annexed to Sardinia; in 1943 it was occupied by the Allies; p. 434,000.

**Palestine**, the term Palestine was used by the Greeks as a designation of Southern Syria, exclusive of Phœnicia. The Romans used the same word in the form *Palestina*, and through them it has come to mean the land once occupied by the Israelites and their immediate neighbors of the east and west. It lies between the eastern shore of the Mediterranean Sea and the Arabian desert, with the southern slope of Mount Hermon as its northern boundary, and a line from the southeastern end of the Mediterranean, pass-

ing a little south of the Dead Sea, to the beginning of the desert, as its southern limit. It is about 150 m. long and 100 m. wide at the broadest part, with an area of over 10,000 sq. m.; p. 1,035,821.

The country is divided by nature into four parallel zones, extending from north to south. The first comprises the narrow coast plains, broadening in the south into the plains of Sharon and Philistia; the second is the central plateau, with high hills in the north, merging into the Plain of Esdraelon, south of which lie the fertile hills of Samaria and the rugged land of Judah; the third is the valley of the Jordan and the Dead Sea a deep trench beginning at the foot of Mount Hermon and sinking to 1,292 ft. below sea level; the fourth, the high land of Edom, Moab, and the region of Trachonitis, stretches east into the Arabian desert.

The climate is greatly diversified. On the coast it is balmy and delightful; in the highlands the central plateau, cool and often cold; in the Jordan valley, moist and tropical; in the highlands of Moab and Gilead, the sun is hot at noonday but the nights are cold, and deep snows cover the hills in winter. There are two seasons, a dry one from April to October, and a rainy one the remaining half of the year. The soil is generally fertile, but this fertility is dependent upon irrigation and cultivation. For the most part it has lain barren and uncultivated for centuries. Cultivated, it yields cereals, lentils, sesamum, and maize, and such fruits as olives, figs, dates, and oranges. Wine is made successfully, and cotton yields satisfactory results.

In the 15th century Palestine, with the rest of Syria became a province of the Turkish Empire. Napoleon, in 1799, returning from Egypt, captured Joppa and laid siege to Acre, but was forced back the following year. From 1832 to 1840 Palestine was again under Egyptian rule, but was recovered by the Turks with the aid of England and Austria. The first German colony was established in Palestine in 1868, and in 1878 Jewish colonization began (see **ZIONISM**). On Dec. 11, 1917, during the Great War of Europe, General Allenby, at the head of a British army, entered the city of Jerusalem, and the liberation of Palestine from the Turk was assured (see **JERUSALEM**; **EUROPE**, **GREAT WAR OF**.)

Prior to the conquest of Jerusalem the British government had entered into three separate agreements affecting the future of

Palestine. Some difficulty was experienced by Great Britain at the close of the war in reconciling its promises to Arabs, to Jews and to the French government. Instead of permitting the Arabic-speaking peoples to set up governments of their own choice a mandate system was devised, which provided for the establishment of a degree of foreign control in the Near East. At a meeting of the Supreme Allied Council at San Remo in April, 1920, the mandate for Syria and the Lebanon was allotted to France, while the mandates for Palestine, Transjordan and Iraq were awarded to Great Britain.

The Arabs of the Near East resented the imposition of the mandates upon their territory. Resentment was particularly keen in the case of Palestine, where Jewish immigration and colonization were proceeding more rapidly than the Arabs relished and where the terms of the mandate provided for the promotion of Jewish interests. Owing to the Arab refusal to coöperate in any scheme of government based on recognition of the Balfour declaration, the British authorities reverted to a purely colonial system of government, but in 1922 Sir Herbert Samuel secured from the British government an official interpretation of the declaration, which did something to allay Arab fears on the one hand and to check the ambition of certain Jewish groups on the other. Emphasis was placed upon the cultural rather than the political aspects of the Jewish national home project, although Jewish immigration to Palestine was to be limited only by the economic capacity of the country to absorb new arrivals.

In the first post-war decade the proportion of Jews in Palestine increased from one-tenth to about one-seventh. Jewish activity resulted in the development of new agricultural and industrial enterprises in the country, while the general standard of living was perceptibly raised. A violent outbreak occurred in Palestine in August, 1929, during the course of which Jews were attacked by Arabs in many sections of the country. In 1933 new riots broke out, this time between the Arabs and British police, the Arabs demanding the cessation of Jewish immigration into Palestine. The riots were suppressed and measures taken, against illicit Jewish settlement in the country.

On October 31, 1933, Sir Philip Cunliffe-Lister, Colonial Secretary, restated the policy of the Mandatory Power as follows: "There is under the Mandate the obligation to fa-

cilitate the establishment of a national home for the Jewish people in Palestine. but at the same time there is an equally definite obligation to safeguard the rights of all the inhabitants of Palestine. Both obligations will be most carefully observed." It was charged that unauthorized immigration was increasing, and the Arabs ordered a general strike, resulting in rioting and loss of life in 1936. Following this there were many outbreaks over several years. The British Government declared, May 17, 1939, that Jewish immigration into Palestine would be restricted.

**Palestrina**, town, Italy, in the province of Rome. The Romans in 380 B.C. built a fortified castle there, now known as San Pietro: p. 7,000.

**Palestrina, Giovanni Pierluigi da** (1524-94), illustrious Italian composer of the polyphonic school of music. Palestrina must be considered the first musician who reconciled musical science with musical art. His most famous work: the *Missa Papæ Marcelli*, see Mass.

**Paley, William** (1743-1805), English divine. In 1780 he became a prebendary at Carlisle Cathedral, and in 1785 chancellor of the diocese. His *Principles of Moral and Political Philosophy*, appeared in 1785. In 1802 he published *Natural Theology, or Evidences of the Existence and Attributes of the Deity*, largely based on the *Religious Philosopher* of Nieuwentyt, a Dutch disciple of Descartes.

**Palfrey, John Gorham** (1796-1881), American historian and theologian. From 1830 to 1839 he was professor of Biblical literature at Harvard; meanwhile becoming editor of the *North American Review* in 1835, which periodical he conducted until 1843. He was secretary of state for Massachusetts from 1844 to 1847, having already taken a leading interest in the anti-slavery movement. During 1851 he was an editor of the Free-Soil organ, the *Commonwealth*. In 1861 he was appointed postmaster of Boston, and served until 1867. Among his works are *Academical Lecture on the Jewish Scriptures and Antiquities* (1838-52), and his monumental *History of New England during the Stuart Dynasty* (1858-64).

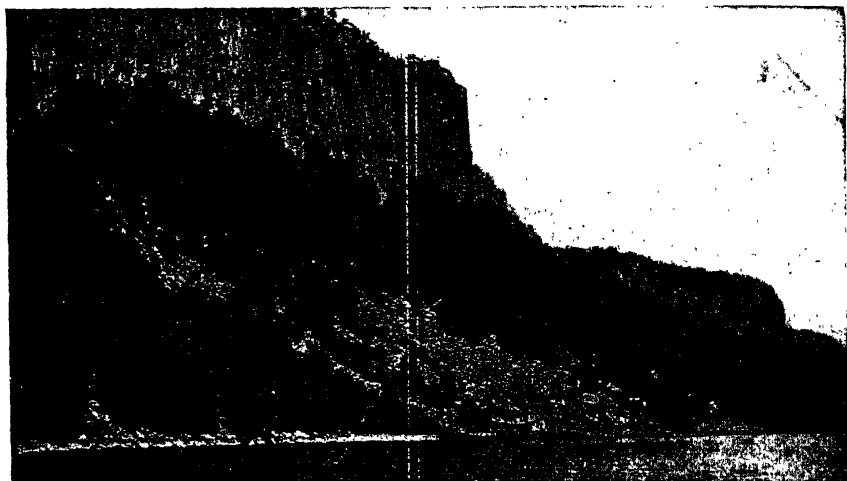
**Palgrave, Francis Turner** (1824-97), English poet and critic, son of Sir Francis Palgrave, was born at Great Yarmouth. He wrote *Idylls and Songs* (1854). He also edited the *Golden Treasury of English Lyrics* (1861 and 1897), *Shakespeare's Poems* (1877), and *The Treasury of Sacred Song* (1889).

**Pali**, the language used in intercourse between cultured people in the north of India about 650-150 B.C., and the first *lingua franca* used in India. It, and the free interchange of opinion of which it was partly the cause, partly the effect, were a main factor in the rise during the 6th century B.C. of great reforming movements, such as Janism and Buddhism. Pali was used as a literary language by Buddhists in India for more than a thousand years, and is still so used in Burma, Siam, and Ceylon.

**Palimpsest**, a manuscript utilized for writing after the erasure of what was originally written upon it. There are references to such a practice in the classical writers, but the

ing and erosion of a thick sheet of diabase intruded between Triassic sandstones and shales. The Palisades form one of the most striking features of the scenery of this beautiful river.

**Palissy, Bernard** (c. 1510-89), French potter, born near Agen; worked as a glass painter, and in 1539 settled at Saintes, where, after sixteen years of labor in the direst poverty, he at last discovered a process for the manufacture of fine enamel. He became famous, and was patronized by the king, who permitted him in 1564 to build his pottery works close to the Tuileries. Specimens of his work are in the J. P. Morgan Collection in New York.



*The Palisades, Hudson River, New York.*

period in which it appears to have been most common extends over the 7th, 8th, and 9th centuries A.D.

**Palindrome**, a form of verse which reads the same backwards as forwards, as in the following example:—

Roma tibi subito motibus ibit amor.

Such composition was one of the puerilities of the middle ages.

**Palinurus**, in ancient Roman legend, the pilot of Æneas on his voyage from Troy to Italy.

**Palisades**, a term used to designate the trap-rock cliff forming the west wall of the Hudson River gorge from Hoboken to Piermont, a distance of more than 20 m. This cliff is precipitous almost from the water's edge and varies from 200 to 500 ft. in total height. It is formed by the exposure in fault-

**Paliurus**, a genus of hardy, prickly shrubs belonging to the order Rhamnaceæ. *P. Spina-Christi* (the garland thorn, Jew's thorn, or Christ's thorn) is supposed to have been the plant used for the crown of thorns.

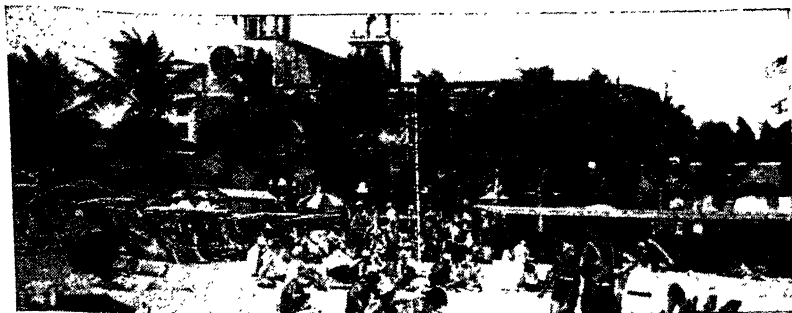
**Palladio, Andrea** (1518-80), Italian architect, was born at Vicenza. He became chief architect in Venice, where he designed many public and private buildings, notably the churches of San Giorgio Maggiore and Il Redentore. His style, known as the Palladian, exercised great influence upon the succeeding generation, being in England particularly exemplified in the work of Inigo Jones.

**Palladium**, an ancient image of Pallas kept at Troy. Legend said that as long as it was safe the city could not be taken. The word 'palladium' has come into general use to designate that which secures any possession, as,

for example, 'Magna Charta is the palladium of English liberty.'

**Palladium**, Pd, 106.5, an element of the platinum family, that occurs along with the other members of the group in metallic grains in river sands in the Urals and in N. and S.

**Pallium**, or **Pall**, a narrow, round band of white woolen cloth worn over the shoulders by the pope, by patriarchs, and by archbishops. To this circlet are attached a breast and back piece, and the whole is embroidered with black crosses.

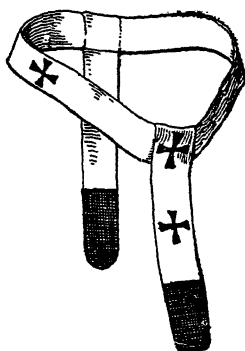


*Palm Beach.*

America. It is prepared from the residues obtained in working up platinum, by precipitating the di-iodide or dicyanide, and is a steel-white metal used in the construction of non-magnetic watches and parts of delicate balances.

**Pallas**, the second asteroid, discovered by Olbers, March 28, 1802. It travels round the sun at a mean distance of 2.77 astronomical units, in a period of 4 years 222 days.

**Pallas**. (1.) The surname of the goddess Athena. See **ATHENA**. (2.) In Roman history



*Pallium.*

one of the freedmen of the Emperor Claudius, whom he urged to marry Agrippina; and after their marriage he and Agrippina were the real rulers of the empire. He also secured the adoption of Nero by Claudius.

**Palm**, a lineal measure based on (1) the breadth of the hand, reckoned variously at three or four inches; or (2) the length of the



*Palm Cañon, San Jacinto Mountains.*

hand, eight inches (the Roman measure). **Palm**, any individual or species of the monocotyledonous group *Palmae* (or *Palm-*

aceæ), generally ranked as an order, though some systematists consider it only as a family of the Spadicifloræ. Bentham and Hooker reckon about 130 genera, with 1,100 species; and these they arrange in six tribes, of which the betelnut palm (*Areca catechu*), the date palm (*Phoenix dactylifera*), the talipot palm (*Corypha umbraculifera*), the rattans (*Calamus*), the Palmyra palm (*Borassus flabelliformis*), and the cocoanut palm (*Cocos nucifera*) may be respectively taken as typical representatives. Nearly all are tropical. To

sorts in the United States and has several fine hotels including the Royal Poinciana, one of the largest hotels in the United States. The district is semi-tropical in character; p. 3,747.

**Palmer, Albert Marsham** (1838-1905), American theatrical manager, was born in North Stonington, Conn. In 1872 he undertook the management of the Union Square Theatre in New York City, and from 1884 to 1888 Mr. Palmer successfully managed the Madison Square Theatre, in New York, producing such popular plays as *Jim the Pen-*



Species of Palms.

1. Date palm. 2. Cabbage palm. 3. Cocoanut palm. 4. Double cocoanut palm. 5. Rattan palm. 6. Doom palm. 7. Palmyra palm. 8. Betel-nut palm. 9. Ivory-nut palm.

the palms civilized man is indebted for coconuts, dates, sago, palm oil, various resins, fiber for cordage, brooms, and split canes. Some of the larger species are cultivated in palm-houses in northern latitudes.

**Palma**, city, capital of the Balearic Isles, Spain, port and fortress on the s.w. coast of Majorca.

**Palma**, or **La Palma**, one of the larger Canary Islands, 15 m. n.w. of Tenerife, covers an area of 280 sq. m.

**Palm Beach**, village, Palm Beach co., Florida, on a strip of land between Lake Worth and the Atlantic coast, 66 m. n.e. of Miami. It is one of the most fashionable winter re-

man, *A Pair of Spectacles*, and *Saints and Sinners*.

**Palmer, Alexander Mitchell** (1872-1936), American public official, born in Moosehead, Penn. In 1917 he was appointed Alien Property Custodian, under the Trading with the Enemy Act; and in March, 1919, he became U. S. Attorney General. In 1921 he retired from public office and resumed the practice of law in Washington, D. C.

**Palmer, Alice Freeman** (1855-1902), American educator, was born in Colesville, N. Y. She was appointed (1879) professor of history in Wellesley College, of which she became acting president (1881) and presi-



dent (1882). In 1887 she resigned, on her marriage to George H. Palmer, professor of philosophy at Harvard. Subsequently (1892-5) she was dean of the women's department of Chicago University.

**Palmer, Edward Henry** (1840-82), English Orientalist. In 1871 he became professor of Arabic at Cambridge. In 1882 he accomplished a famous ride from Gaza to Suez, winning over the Arab tribes from Arabi Pasha, but essaying another similar expedition, he was murdered at Wady Sudr. Palmer was a marvellous Oriental linguist, and a skilful mesmerist and conjuror. His works include *Oriental Mysticism* (1867), *Arabic Grammar* (1874), and a translation of the Koran (1880). Consult *Life* by Besant.

**Palmer, Erastus Dow** (1817-1904), American sculptor, was born in Pompey, N. Y. His works, many of which show imagination and vigorous technique, include ideal bas-reliefs such as 'Faith,' 'Mercy,' etc. Portrait busts of Alexander Hamilton and Washington Irving were acquired by the New York Historical Society.

**Palmer, Frederick** (1873), American correspondent and author, was born in Pleasantville, Pa. In 1895 he went to London as the correspondent of several American newspapers. During the World War (1914-18) he was the only accredited representative of the American press with the British forces, and upon America's entrance into the war became a major in the Signal Corps of the U. S. Army (1917), and lieutenant-colonel (1918). His books include: *Going to War in Greece* (1897); *America in France* (1918); *Newton D. Baker* (1931); *With My Own Eyes* (1933).

**Palmer, George Herbert** (1842-1933), American educator, was born in Boston, Mass. He was assistant professor of philosophy at Harvard in 1873-83, full professor in 1883-9, and Alvord professor of natural religion, moral philosophy, and civil polity from 1889 to 1913, when he became professor emeritus. He married in 1887, Alice Freeman, president of Wellesley College (see PALMER, ALICE FREEMAN.) He published an English translation of the *Odyssey* (in rhythmic prose) in 1884 and wrote also: *Self Cultivation in English* (1897); *The Life of Alice Freeman Palmer* (1908); *Formative Types in English Poetry* (1918); *Altruism: Its Nature and Varieties* (1919); *Homer's Odyssey* (Trans., 1929); *Autobiography of a Philosopher* (1930), etc.

**Palmer, Nathaniel Brown** (1799-1877),

American navigator, born at Stonington, Ct. He went to sea at the age of fourteen and in 1821 discovered the land in the Antarctic now called Palmer Archipelago.

**Palmer, Ray** (1808-87), American clergyman and poet, was born at Little Compton, R. I. Dr. Palmer was of the foremost hymn-writers of his time, his hymns including 'My Faith Looks up to Thee,' (1831) 'Jesus, Lamb of God, for Me' (1863), and 'Thou Saviour, from Thy Throne on High' (1864).

**Palmer, Walter Launt** (1854-1932), American landscape painter. In 1887 he won the 2d Hallgarten prize at the National Academy of Design, a medal at Chicago in 1893, honorable mention at Paris in 1900, a silver medal at Buffalo in 1901, and again in 1904 at St. Louis, where he had one of his typical snow scenes, entitled *Across the Fields*. He was elected to the National Academy of Design in 1897. His pictures are mostly winter scenes, with a glow of sunlight upon the snow. He is remarkably successful in portraying the end of a clear winter's day in New England.

**Palmerston, Henry John Temple**, Third Viscount (1784-1865), British statesman, was born at Broadlands, Hampshire. See P. Guedalla, *Palmerston* (1927).

**Palmetto Leaves**, the leaves of the palmetto palm (*Sabal palmetto*), a native of the Southern States of America. See PALM.

**Palmi**, tn., Reggio prov., Calabria, Italy, 26 m. by rail n.e. of Reggio; has fishing; p. (1901) 13,346.

**Palmira**, tn., in the department and valley of Cauca, Colombia. It is a modern town, ranking second in the department, and especially noted for raising an excellent grade of tobacco; p. 27,032.

**Palmistry** includes chiromnomy, the art of recognizing the tendencies of intelligence according to the forms of the hand; chirosophy, the science of the comparative study of hands; and chiromancy, divination from lines and marks on the hands and fingers. Modern research has found in the development of the first two divisions a reason and excuse for the old and fictitious importance of the third. Seven types of hand are usually recognized—the elementary (large-palmed), necessary (spatulated), artistic (conical), useful (square), philosophical (knotty), psychic (pointed), and the mixed, in which types are blended.

**Palmitic Acid**,  $C_{15}H_{31}COOH$ , is a monobasic acid of the fatty series, and is present in palm oil as such, but mainly occurs as its

glycerol ester (palmitin) in solid fats and olive and palm oils, from which it is prepared by hydrolysis. The product obtained from fats contains stearic acid, the next but one higher member of the series, and forms the so-called 'stearin,' largely used along with paraffin wax for the manufacture of candles. Palmitic acid forms salts; that of magnesium is employed to separate palmitic from stearic acid by fractional crystallization; that of sodium is one of the chief components of hard soap, and that of potassium of soft soap.



Lord Palmerston.

**Palm Oil** is obtained from the pulp of the fruit of several palms, notably *Elaeis guineensis*. Palm oil is used for soap-making and for lubricants. The palm kernels also yield an oil, though of a different character.

**Palm Sunday**, the Sunday before Easter, which commences holy week; it is so-called from the palm branches which were strewed before Jesus Christ on His public entry into Jerusalem.

**Palmyra**, anc. city, in an oasis of Syrian desert, on trade route between Syria and Mesopotamia, and about 150 m. n.e. of Damascus. Its foundation is attributed to Solomon. Under the Roman emperors of the 2d century A.D. it became a place of great prosperity. The ruins which still remain are ex-

tensive and magnificent, the principal being those of the temple of Baal, with a colonnade nearly one m. long.

**Palmyra Wood**, the wood of the Palmyra palm (*Borassus flabelliformis*), a lofty tree, native of the tropical parts of Asia. Palmyra wood is highly valued for its weight and durability.

**Palo Alto**. Tn., Santa Clara co., Cal., 26 m. s. by e. of San Francisco. It is the seat of Leland Stanford Junior University, founded and endowed by Leland Stanford. Farming and fruit growing are the leading industries of the district. The first settlement was made here about 1890, and the place was incorporated in 1894; p. 16,774.

**Palo Alto**. A battle of the Mexican war, fought May 8, 1846, by Gen. Zachary Taylor and 2,288 American soldiers and Gen. Arista with more than 6,000 Mexicans. The battle was chiefly fought by the artillery, and Gen. Arista withdrew during the night. This battle, together with that of Resaca de la Palma, the next day, inspired much confidence in the Americans and settled the possession of the disputed territory between the Rio Grande and the Nueces. See Howard, *General Taylor* (1892), in Great Commanders series.

**Palolo**, a remarkable annelid (*Eunice viridis*), a chaetopod having its home in the coral reefs into which it bores, which appears periodically at the surface of the sea in the Samoan Is. The swarming takes place in October and November, on the day before the last quarter of the moon, and occurs at dawn. At that time the natives assemble in their boats and collect them in vast numbers for food, the occasion being marked by a great festival.

**Palpitation** (of the heart), a distressing irregularity in the heart's action. Two classes are recognized. In the one the heart's action is very violent, as well as irregular, the force being in excess; in the other the movements are feeble and inefficient, as well as irregular.

**Palsy**. See **Paralysis**.

**Paludan-Müller, Frederik** (1809-76), Danish poet, was born at Kjerteminde in Fünen; he attracted attention while still a student by his romantic drama *Kjærlighed ved Høftet* (1832). His masterpiece, one of the notable productions of literary genius, is the great satirical poem *Adam Homo* (1841-9; new ed. 1899). Paludan-Müller is one of the most distinguished European poets of the 19th century.

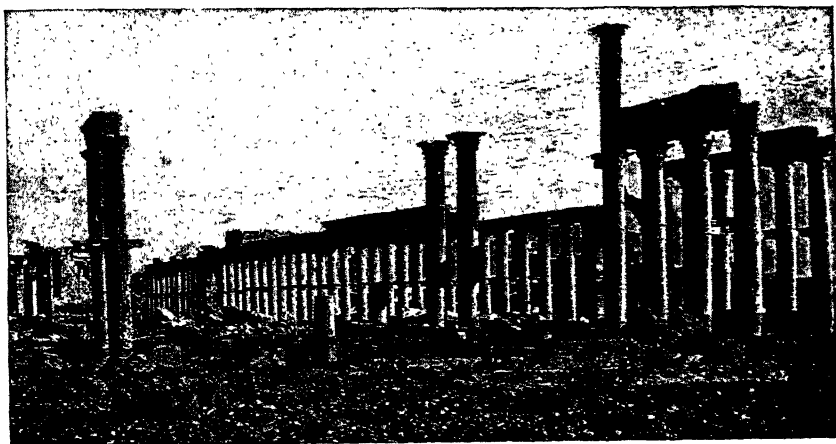
**Pamirs** (*Pamir*, 'roof'—i.e. of the world),

a mountain region of Central Asia. The Pamirs, including the Bolor-tagh, form the nucleus of the Central Asiatic highland system. Essentially it is a n.w. extension of the Tibetan table-land; its extreme length, from n. to s., is about 280 m.; its extreme breadth, from e. to w., about 150 m.; its area covers more than 28,000 sq. m.; its mean elevation is fully 12,000 ft. above sea-level. The Great Pamir is a term used particularly of the s. central part of the plateau, in the valley of the Pamir river and Lake Victoria (Zorkul); the Little Pamir lies to the s. of this,

fall (10 to 15 in. in the west) occurs mainly in summer.

**Pampanga**, prov., Luzon, Philippines, on the n. shore of Manila Bay. Area, 2,209 sq. m. There are mountains in the n. and two ranges on the w., one of them forming the boundary. The s. part is low, covered with waterways, and raises great quantities of rice; p. 222,656.

**Pampas Grass**, the popular name of some nearly hardy American grasses, of which *Gynerium argenteum* is the species most commonly grown.



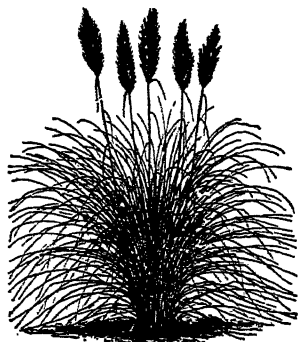
*Temple of Jupiter at Palmyra.*

in the upper Ak-su valley. The inhabitants of the Pamir region do not exceed 70,000 in the most favorable summers when the Karakirghiz pasture their flocks there. Four-fifths of the whole now belongs to Russia. Small sections of the table-land remain in Chinese and Aghan possession. The great-horned sheep of the Pamirs (*Ovi Poli*) is the most famous among the fauna.

**Pamlico Sound**, a shallow sea lagoon in the e. part of N. C., separated from the Atlantic Ocean by long, narrow, sandy islands. It has communication with the ocean in three places by means of New Inlet, Ocracoke Inlet, and Hatteras Inlet respectively. The Pamlico and Neuse rivers empty into the sound, which communicates in the n., through Croatan Sound, with Albemarle Sound. A thriving fishing industry is carried on here.

**Pampa**, a grassy and completely woodless expanse in southern S. America. The pampas extend from the Andes to the Atlantic, between 30° and 40° s. lat. The small rain-

**Pampero**, the name applied generally to a s.w. wind blowing off the pampas of the river Plate in S. America.



*Pampas Grass.*

**Pamphlet**. In the 12th century A.D. a Latin poem called *Pamphilus de Amore* attained a great success, and by its popularity gave rise to the diminutive form *pamphilet* or

*panflet*, which was applied generally to any small treatise, whether in prose or in verse. The word as now used implies that the sheets of the treatise are only stitched together or sewn in a paper wrapper, not bound or cased in cloth; and secondly, that the work is an exposition in prose of its author's views or discoveries, and not a work of fiction or imagination, or, on the other hand, a quite dispassionate and impersonal monography.

**Pamplona**, or **Pampeluna**, city, Spain, capital of the province of Navarre. It is a strong fortress, on a commanding spur of the Pyrenees. It has a fine 14th-century Gothic cathedral, with beautifully carved choir stalls.

**Pan**, a Greek god of pastures, forests, and flocks, usually described as a son of Hermes. His worship originated in Arcadia, but spread gradually over the rest of Greece. Pan is represented as having horns, a goat's beard, a crooked nose, pointed ears, a tail, and goat's feet. He is the giver of fertility, hence is represented as lustful and vigorous. He is also represented as fond of music, and of dancing with the forest nymphs.

**Panama**, a republic of Central America, occupying the isthmian territory between Costa Rica on the west and Colombia on the east, and between the Caribbean Sea on the north and the Pacific Ocean on the south. Five-eighths of the area of Panama, consisting of rugged hills and mountains, overgrown with dense tropical vegetation, and of coastal swamps, is unoccupied. The climate in general is warm, and in the swamp regions unhealthy; but near the Costa Rican frontier it is salubrious. The mean temperature of the republic is about 80°. The wet season lasts from April to the early part of December; the dry, during most of the winter and the early part of spring. The soil is remarkably fertile. The forests are rich in valuable hardwoods, such as cedar, cocobolo, and mahogany, whose export is steadily increasing. Gold and salt are the only minerals worked. The banana industry, which is the most important, has been developed by the United Fruit Company of New York, which owns extensive plantations in the province of Bocas del Toro.

At Chepignana, in Panama province, Panama hats are made. The National Institute was opened in 1912 in Panama city and a university was founded in 1917. The government, established by the Constitution of 1904, and amended in 1918 and 1928, is a republic and consists of a single Chamber of Deputies,

or National Assembly (one member for every 15,000 inhabitants), and a president elected for four years and ineligible for re-election. There is a cabinet of five members. The territory now known as Panama was under Spanish rule from 1510 to 1819. The Panama Isthmus was visited in 1502 by Columbus, who established a settlement or colony at Nombre de Dios, near Porto Bello Bay. In 1718 Panama became part of the viceroyalty of Grenada, and in 1819 revolted from the rule of Spain.

In 1853 Panama joined the Confederation of Granada, afterward known as the United States of Colombia. By the terms of the Hay-Pauncefote Treaty, the United States in 1901 acquired the right to construct and control a canal across the Isthmus of Panama, but was obstructed by the Colombian Congress. The failure of the French Canal Company to construct a canal across the isthmus had already prepared the way for an uprising, in which Panama seceded from Colombia, and became a republic duly recognized by the United States. On Nov. 18, 1903, by treaty with Panama the United States acquired the territory known as the Canal Zone. The first president of the new republic was Manuel Amador Guerrero. Panama declared war on Germany, Italy, and Japan, 1941.

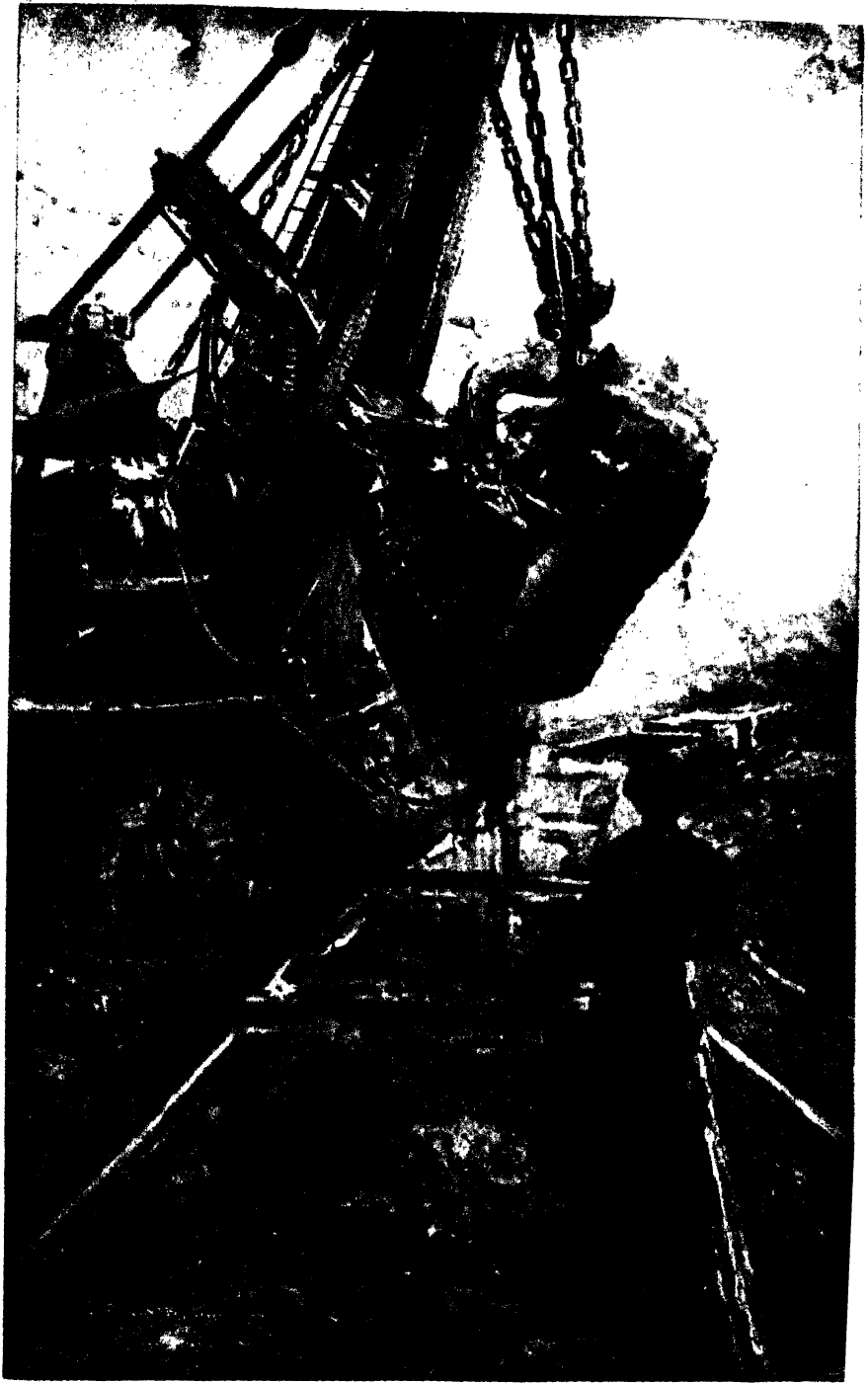
**Panama**, city, capital of the republic of Panama, at the southern extremity of the Panama Canal and the Canal Zone. The city, which is nearly surrounded by an old granite wall, is irregularly laid out; the streets winding and narrow, and lined with stone houses of Spanish style, with projecting balconies. The port of Panama, Balboa, about three m. w. of the city is within the Canal Zone and under American jurisdiction.

**Panama, Bay of**, inlet of the Pacific Ocean, Panama, on the south side of the Isthmus of Panama. The Pearl Islands, so called from their pearl fisheries, are in the bay.

**Panama, Isthmus of**, a narrow neck of land uniting the two divisions of the American Continent.

**Panama-California Exposition**, an international exposition held in the city of San Diego, Cal., to celebrate the completion of the Panama Canal.

**Panama Canal**. Within 20 years of the discovery of the Isthmus of Panama, the discoverers of the New World began seriously to consider the project of building a canal across the isthmus connecting North and South America. In 1879 an international



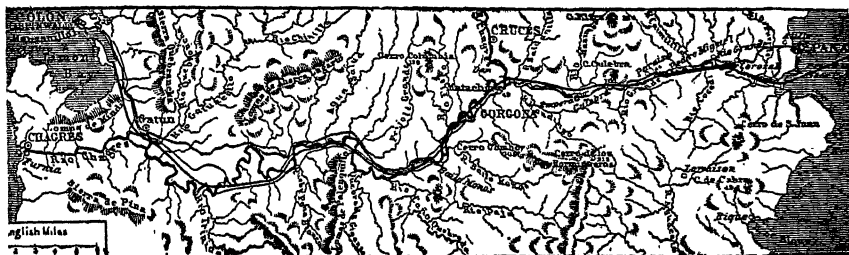
A STEAM SHOVEL



scientific congress, under the practical control of Ferdinand de Leseps, decided that the canal should be located on the Panama route, and that it should be a sea-level canal without locks. The organization of the first French company took place immediately after the adjournment of the congress. It was called the 'Compagnie Universelle du Canal Interocéanique,' and Ferdinand de Leseps was elected its president. Operations were begun upon a large scale in 1883. Work on the canal was vigorously prosecuted until 1889, when the company became bankrupt. The entire property of the canal company was put in charge of a liquidator, and remained in his hands until 1894, when the new Panama Canal Company was organized and took over the assets of the old company.

January, 1906, reported in favor of a sea-level canal at Panama by a vote of eight to five, the minority at the same time submitting a proposed plan for a lock canal. The lock plan received the support of the Secretary of War and the President. The latter submitted that plan to Congress, with arguments in favor of it, and it was finally adopted by both the Senate and the House of Representatives. On Feb. 26, 1907, Col. George W. Goethals of the Engineer Corps, U. S. A., was placed in full charge, and two other army engineers were designated to assist him.

The route of the Panama Ship Canal is essentially the same as that of the Panama Railroad Company. Its total length from the seven-fathom curve in the Bay of Limon, at the Caribbean end of the Canal, to the



*The Isthmus of Panama.*

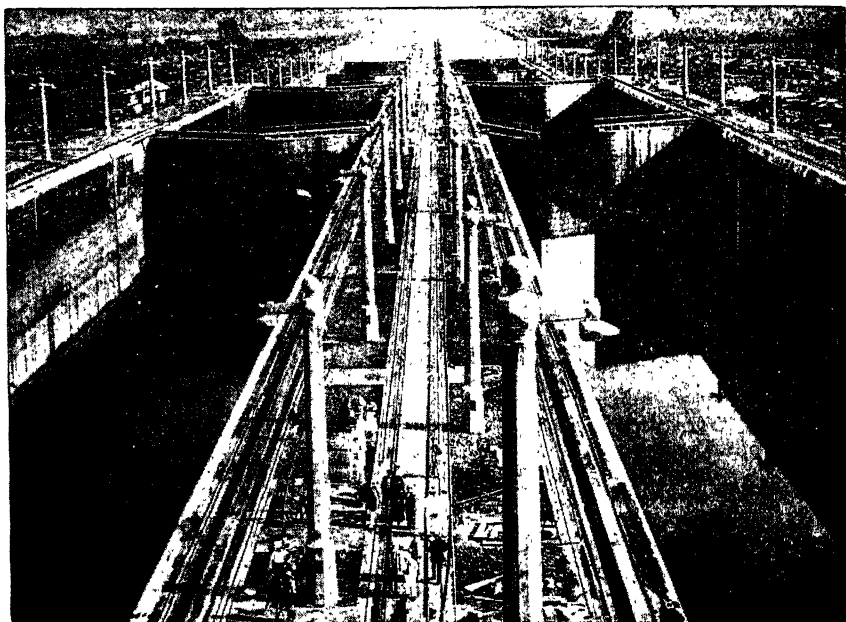
The conflicting claims, put forth by the advocates of different proposed routes for a ship canal across the Central American isthmus, led to the creation of the first Isthmian Canal Commission by Act of Congress of March 3, 1899. This commission was charged with the duty of determining the most practicable and feasible route for a ship canal. It reported on Nov. 16, 1901, in favor of the Nicaragua route. When news of this report reached Paris it caused a reorganization of the New Panama Canal Company, and under resolution passed at a general meeting of the stockholders, the new management was authorized to sell to the United States Government all its properties, rights, and concessions for the sum of \$40,000,000, the value of the property as estimated by the Isthmian Canal Commission in its first report. The second Isthmian Canal Commission assumed office in March, 1904, and was charged with the actual construction of the Canal and with the government of the Canal Zone, under the direction of the Secretary of War. An International Board of Consulting Engineers visited the Canal in October, 1905, and in

seven-fathom curve at the Pacific end is nearly 50 m. The average width of the Canal is 649 ft., and the minimum width 300 ft. The minimum depth of the approach channel at the Caribbean terminus is 41 ft.; the approach channel at the Pacific entrance has a minimum depth of 45 ft. below mean sea level. The width of both these approach channels reaches 500 ft. The deep approach channel at the Panama end of the Canal is about 4 miles long, and leads out into Panama Bay, to deep water immediately to the west of the islands of Perico and Flamenco. The distance between shore lines of the Isthmus on the route of the Canal is about 41½ miles.

In entering the Canal from the Atlantic side, a ship proceeds from deep water in Limon Bay to Gatun locks. Passing into the locks, 0.78 of a mile in length, the ship is carried up to an elevation of 85 ft. above sea level in three lifts to the level of the water in Gatun Lake. Thence for a distance of 16 m. the channel is from 1000 to 800 ft. in width to San Pablo; thence to Juan Grande (3.8 m.), through a channel 800 ft.

wide; from Juan Grande to Obispo (3.7 m.), the channel is 500 ft. wide; from Obispo to Pedro Miguel locks, through the Culebra cut (about 8.2 m.), the channel is 300 ft. wide. Going through the Pedro Miguel lock and approaches, 0.37 of a mile in total length, the vessel is lowered to the level of Miraflores Lake, 55 ft. above mean tide, through which there is a channel 500 ft. wide and 1.4 m. long to the Miraflores locks; thence through the two Miraflores locks and their approaches, 0.58 of a mile, the vessel is lowered to tide level and proceeds through a channel 500 ft. wide and 8 m. long to deep water in the

Government also maintains coaling plants at both entrances, and storage basins at Cristobal and Balboa. Oil tanks have been installed at Balboa and Mt. Hope. In 1912 the Panama Canal Act, which provided for the opening, maintenance, protection, and operation of the Panama Canal, and the sanitation and government of the Canal Zone, was signed by President Taft. On Jan. 27, 1914, President Wilson established the permanent government of the Canal Zone; and Col. G. W. Goethals, to whose administrative capacity the Canal already owed so much, was appointed first governor.



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*Gatun Locks.*

Pacific. The time required for the passage of a ship through the entire length of the Canal is from 10 to 12 hours.

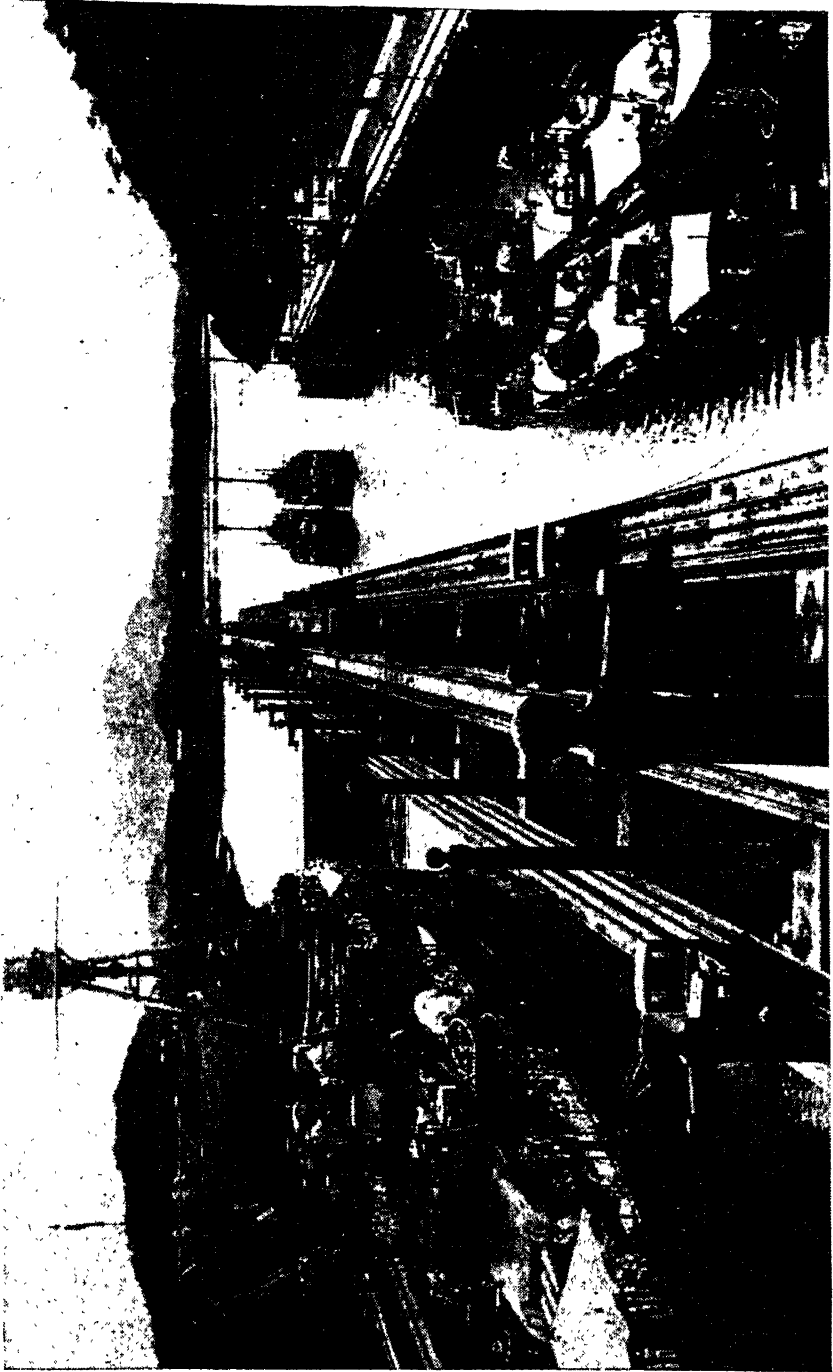
In 1910 widespread discussion arose in the United States as to the advisability of fortifying the Canal. The opponents of this policy claimed that to fortify the Canal would invite attack in the event of war, and urged its neutralization under the protection of The Hague agreement. eventually, the policy of fortification triumphed, and the Sundry Civil Appropriations Bill, passed by Congress on March 4, 1911, carried an initial appropriation of \$3,000,000 for that purpose. The

President Wilson, on March 12, 1914, read a message before Congress calling for outright repeal of the tolls provision. As the result an Act repealing the disputed provision was passed.

By act of Congress, approved Aug. 5, 1909, authority was given for the issuance of bonds to the amount of \$375,200,900, to cover the cost of the Canal from its inception to its completion. The Canal was opened to navigation on Aug. 15, 1914, when the government steamship *Ancon* made the trip through the Canal in about nine hours' time.

**Panama Hat**, a fine plaited hat made from





*Ships of U. S. Navy passing through Miraflores Locks, Panama Canal*

the fan-shaped leaves of *Carludovica palmata*. Genuine Panama hats are mostly made in Central America; but many others so called are manufactured in America and Europe.

**Panama-Pacific Exposition**, an international exposition held in San Francisco from Feb. 20 to Dec. 4, 1915, to celebrate the opening of the Panama Canal and the 400th anniversary of the discovery of the Pacific. Preparations were inaugurated on Oct. 14, 1911, when the first shovelful of earth was turned by President Taft. The exposition was financed and controlled by San Francisco and California, but national recognition was given it by an Act of Congress, and an invitation to participate was issued to the nations of the world by Presidential proclamation in 1912. For the erection of the temporary Exposition buildings, a site was selected fronting the bay, near the Presidio and overlooking the Golden Gate. The central architectural feature of the Exposition was the Tower of Jewels, scintillating with 125,000 jewels in imitation of precious stones, and rising 435 ft. in a series of seven decorative terraces. The plans for the Exposition included the assembling of warships from the foreign countries as well as the United States; sports and military manœuvres; exhibits of live stock and agricultural and industrial products; Oriental pageants; an assemblage of native tribes from remote parts of the world; and a grand pageant representing the history of California. The total number of exhibits was placed at 80,000, and included 39 foreign nations and 40 States. The estimated value of the Exposition, with its exhibits, was over \$350,000,000.

**Pan-America**. The Pan-American movement implies a sympathy of action among the American republics for the material, moral, social, and intellectual development of the Western Hemisphere. This, on the basis of political and governmental harmony, and therefore not at all hostile to Europe, offers a system founded on government through the people in the form of such republics as are established in the New World in contrast to the monarchical government of the Old World. Pan-America comprises 21 republics in America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Uruguay, Peru, Venezuela, Panama, Costa Rica, Guatemala, Honduras, Nicaragua, Salvador, Mexico, Cuba, Haiti, Santo Domingo, the United States.

The Monroe Doctrine of 1823 gave a distinct emphasis, at that time, to the political

significance of the movement, because it boldly announced that there would not be tolerated any monarchical interference with republican progress in America. The first suggestions for Pan-Americanism were largely sentimental, but the idea grew, nevertheless. In 1847 a real American congress was held in Lima. By far the better purpose of the Pan-American movement, however, and the direction it began to take in 1880, was as an effort for mutual understanding and harmony of interests—material and physical, rather than political and sentimental. This was not held; but James G. Blaine had the satisfaction of seeing his ambition realized in the First Pan-American Conference of 1889.

**Pan-American Exposition**, the fourth American exposition since the World's Columbian Exposition at Chicago, was held at Buffalo, N. Y., from May 1 to Nov. 2, 1901. It was intended to represent the progress of Americans during the 19th century, and to emphasize the community of interests among the nations of the Western Hemisphere. Special attention was devoted to color effects and the exposition was known as the Rainbow City. The Art and New York buildings were permanent. In spite of many attractions the exposition was a financial failure. This was attributed in part to unfavorable weather conditions and in part to the assassination of President McKinley while in attendance at the Exposition.

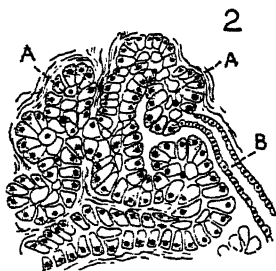
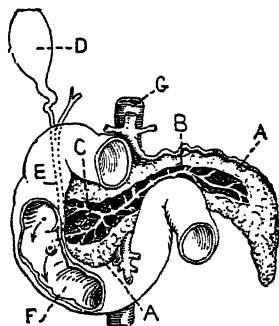
**Pan-American Union**, the official organization supported by the American republics, was established as the International Bureau of American Republics in 1890, under resolutions of the First International Conference of American Republics. It is the agency and custodian of archives of the International American Conferences and occupies a beautiful building in Washington, D. C., part of which was the gift of Andrew Carnegie, the remainder of the American republics. Consult *Pan American Union Bulletin*.

**Panay**, one of the Philippine Islands. The mountains are thickly wooded and rice, cotton, coffee, cacao, sugar cane, and corn are cultivated. There are also deposits of coal and marble. The chief town is Iloilo; p. 750,000. Panay was the scene of conflict between Japanese and American forces in World War II.

**Panchatantra**, the oldest collection of apologues and stories in Sanskrit literature.

**Pancreas**, an abdominal organ concerned in digestion. It lies just below the diaphragm, and for the greater part close behind the

stomach. It is a compound racemose gland, and in structure analogous to, but more complex than, salivary glands. The organ secretes a fluid known as pancreatic juice, which passes along the pancreatic duct into the duodenum, and emulsifies fats, converts starch and sugar into glucose, and changes proteids into that form (peptone) in which they are absorbed through the intestinal walls.



*Pancreas.*

1. A, Pancreas; B, pancreatic duct; C, accessory duct; D, gall bladder; E, bile duct; F, duodenum, showing openings of C and E. 2. Microscopic section of part of pancreas; A, A, alveoli; B, duct.

**Panda** (*Aelurus fulgens*), a very curious carnivore, apparently allied to the raccoon, and confined to the Southeastern Himalayas, where it occurs at heights of from 7,000 to 12,000 ft. It is about the size of a large cat, and is sometimes called the Cat-Bear. The fur is chiefly of a bright red color, the face being marked with white, and the long, thick tail ringed with pale red and yellow. The head is broad and rounded, the ears large, the feet furnished with large claws and furred soles. In disposition the panda is gentle and can be easily tamed.

**Pandan**, pueblo, Antique province, Panay Island, Philippines; 75 m. n.w. of Iloilo.

**Pandarus**, in ancient Greek legend, one of the Lycian allies of the Trojans, renowned as an archer.

**Pandean Pipes**, one of the earliest forms of musical instrument, usually consists of a single row of seven or more short reeds or pipes, closed at their lower ends and joined together; also graduated in length so as to produce the notes of the diatonic scale when the pipes are individually sounded by blowing across their upper ends.

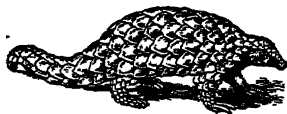


*Pandean Pipes.*

**Pandora**, in ancient Greek mythology, the first woman on earth. She brought with her a box containing every kind of ill; this was opened, and the ills escaped and spread all over the earth, hope alone being left at the bottom of the box.

**Pangasinán**, prov., Luzon, Philippines, on the Gulf of Lingayen, at the center of the China Sea coast. The province contains considerable mineral wealth.

**Pango-Pango**, seapt., on the s.e. coast of Tutuila Isl., Samoa. In 1887 it became an American coaling-station. The island was annexed to the U. S. in 1899.



*Pangolin.*

**Pangolin**, or **Scaly-Ant-eater** (*Manis*), a genus of edentates peculiar to the Old World. The body, with the exception of the under surface and the inner sides of the limbs, is covered by overlapping horny scales.

**Pankhurst, Emmeline** (1858-1928), English suffragist, with her daughter Christabel founded (1903) the Women's Social and Political Union, which indulged in much law-breaking; imprisoned several times; released after resorting to hunger-strikes.

**Panorama**, a cylindrical picture viewed from a central roofed and shaded platform, the scene standing out in strong relief, and

being lighted in front from above and behind by concentrated rays from windows.

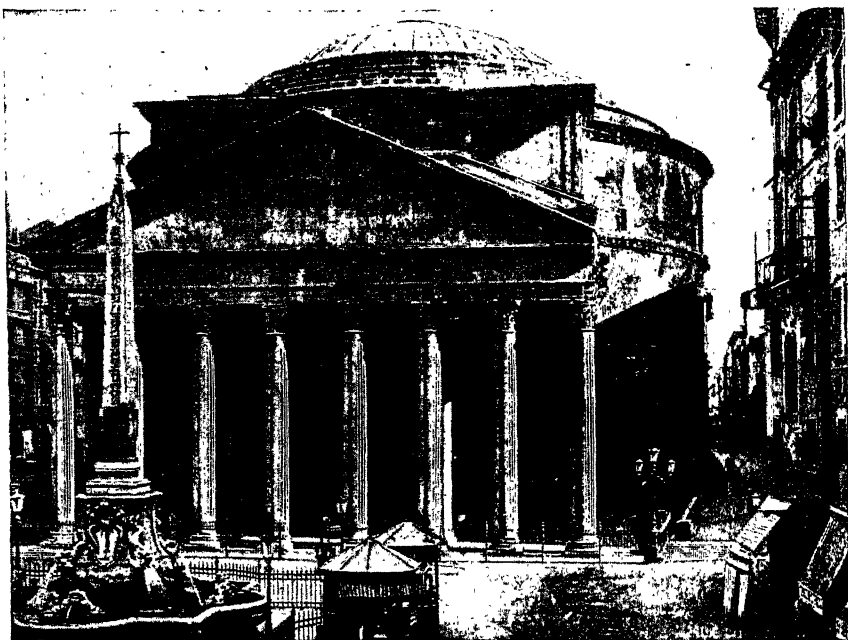
**Panos**, South American Indians scattered along the Marañon, Huallaga, and Ucayali; famous navigators with large canoes.

**Pansy**, or **Heart's Ease**, a little European plant (*Viola tricolor*) which bears through the summer flowers usually yellow or yellow and purple in color. Beds should be carefully prepared with well-rotted manure, leaf mould and loam, and a bit of sand in heavy soil. Shade new-planted pansies, but remove as soon as the sun is off. If very dry weather,

as a burial-place for great Italians. For the Panthéon at Paris, see **PARIS**.

**Panther**. A name applied in Europe to the Leopard and in the U. S. to the Puma.

**Pantomime** was originally the name given to a class of actor, not to the spectacle or play in which he took part. These performers rose into special prominence in the early days of the Roman empire. The entertainment was entirely of a mimetic kind, accompanied by music, the place of speech being supplied altogether by skillful gesture. The real origin of modern pantomime is probably



*The Pantheon, Rome.*

stir the earth first, and then thoroughly soak it twice a week. Feed them liberally, but stop at any disposition to run.

**Pantheism** means, broadly, a theory of the universe which identifies God with the sum of finite existences, or regards God as the single principle of which these are the manifestations. The historical system of the occident, in which pantheism is most clearly exhibited, is that of Spinoza. The most fearless and thoroughgoing pantheism known is that of the Indian philosophy.

**Pantheon**, a temple in ancient Rome, erected by M. Vipsanius Agrippa in 27 B.C., in honor of Mars and Venus. It is now the church of Santa Maria Rotonda, and is used

to be found in the improvised comedy of mediæval Italy, the principal conventional characters in which were *Pantaleone* (Pantaloön), *Arlecchino* (Harlequin), and *Columbina*. It was probably in 1723 that pantomime was introduced into England with the pantomime *Harlequin Dr. Faustus* produced at Drury Lane. It was at Garrick's Drury Lane pantomime in 1758 that Giuseppe Grimaldi, father of Joseph Grimaldi, prince of pantomime clowns, made his début.

**Panzer Division**, the mechanized armored defense unit of Nazi Germany. It is used to co-ordinate with attack aviation in enemy artillery areas and to turn enemy flanks.

**Paoli, Pascal** (1725-1807), Corsican pa-

triot and general. On the Corsican insurrection against Genoa, Paoli was elected ruler of the island (1755). Genoa having sold Corsica to France (1768), Paoli was defeated, and fled to England (1769). He was appointed (1790) governor of Corsica by the French during the revolution, but was proscribed. At his request the British occupied the island (1794), and evacuated it (1796).

**Paolo Veronese.** See **Veronese, Paolo.**

**Pao-ting-fu**, city, cap. of prov. Chi-li, China, was captured by the French in 1900.

**Papacy.** Rome as the capital of the Roman empire was the natural center of the early Christian organization, and the bishop of Rome was at the time of the councils of Nicaea (325) and Antioch (341) recognized as metropolitan. From the removal of the imperial court to Constantinople Rome stood forth as the champion of orthodoxy, and the papal prerogatives were gradually formulated and recognized. The division of the empire in 395 assisted the firm establishment of the authority of the bishop of Rome.

By the time of Gregory the Great (590-604) the church had acquired a considerable amount of landed property, and its power was much enhanced by its friendship with the Frankish kings. By the close of the 7th century the theory of the primacy of the bishop of Rome was accepted throughout the West. After 800 the popes claimed to crown the emperor, and the emperors asserted the right to confirm the election of the pope. During the 11th and early part of the 12th century the Curia passed through a period of deep degradation before such men as Gerbert (Silvester II. 999-1003) and Hildebrand rescued it from its unfortunate position. Nicholas II. (1059-61) improved the method of electing the pope. Gregory VII. (1073-85) insisted on administrative reforms in the church, and on a reformation in the morals of the clergy, and attempted to secure the subordination of the state to the church. This great improvement in the papacy coincided with the foundation of the religious orders and with the outbreak of the crusades. By them the prestige of the papacy was enhanced, while the growth of canon law, the victory in the investiture contest, and the influence of Bernard of Clairvaux, the firm advocate of the papal claims, did much to place the papacy in a position of independence. The rule of Innocent III. (1198-1216) marks the culminating point of the papal power. Boniface VIII. (1294-1303) suffered defeat in attempting to force England and France to obey his

mandates. From 1309 to 1377 the popes lived at Avignon, and during this 'Babylonian captivity' alienated England and Germany, and lost much of their power.

The year after the return to Rome the great schism broke out, which was not ended till 1414-16 with the Council of Constance. The protest of the Reformation was at first directed only against abuses of administration and disputed interpretations of doctrine, but soon a real break with the papacy became inevitable. The break of England and all Northern Germany from Rome caused a counter-reformation in the Catholic Church, with Pope Paul III. (1534-49) at its head. He recognized the spiritual needs of the time, and encouraged the reformation of the monastic bodies, and the foundation of new orders such as the Capuchins, the Theatines, and the Jesuits, who did much in the work of revival.

The 18th century was a time of trial for the papacy. The movement known as the 'Enlightenment,' represented in France by Voltaire and the Encyclopædists, was at its height. The general attack on the Jesuits between 1758 and 1770 revealed at the same time a growing hostility on the part of most European rulers. The whole course of the French Revolution was disastrous, at least for the time being, to the cause of Roman Catholicism. It was not till after 1815 that a reaction in favor of religion took place, and the Jesuits, who had been abolished by Clement XIV., were restored. In 1854 the bull *Ineffabilis Deus* declared the Immaculate Conception of the Blessed Virgin Mary to be a doctrine of the Church. In 1864 a papal Syllabus named as errors of the age, religious toleration, liberty of conscience, freedom of the press and of speech, the separation of church and state, and secular education. In 1870 papal infallibility was proclaimed; but the same year Victor Emmanuel, by the occupation of Rome and the annexation of the Papal States to the kingdom of Italy, put an end to the temporal power of the popes, who thereafter refused to recognize the Italian government, and considered themselves 'captives' in the Vatican.

Leo XIII. (1878-1903) held firmly to his own rights, protested against heresy, and declared that in religion was to be found the only solution of socialistic problems. He was succeeded by Pius X. (1903-14). During his reign, church and state were separated in France and Portugal. He issued a strong encyclical against French disestablishment in

1906, and the following year a Syllabus containing a list of 65 condemned propositions and an encyclical against modernism. He created two new American cardinals, codified the canon law, and reformed church music. He was succeeded by Benedict xv. (1914-22), who promulgated the new code of canon law begun by his predecessor. During Benedict's pontificate, relations with France and Portugal were restored. His influence upon Italian politics was constructive, and in January, 1919, he freed Italian Catholics from all inhibition against participating in the political movements of the country. In 1922 Cardinal Ratti succeeded to the papal chair as Pius xi. In 1929 the controversy between the Church and State in Italy, which had kept the popes 'captive' in the Vatican since 1870, was ended by the creation of the Vatican State, territory in Rome belonging to the Holy See, established by the Lateran Treaty, signed by Cardinal Gasparri on behalf of the Pope, and by the representative of the King of Italy. In 1939, Cardinal Pacelli became Pope, as Pius xii., and adhered to the policies of his predecessor. See VATICAN CITY AND ITALY.

**Papal States.** See **Church, States of the.**

**Papaver**, a genus of hardy or half-hardy herbaceous plants belonging to the order Papaveraceæ. They are usually characterized by a milky or colored juice and a single ovary which becomes a capsule containing several seeds. There are over 100 species, but only four are commonly cultivated, the opium poppy, corn poppy, Iceland poppy, and oriental poppy.

**Papaw**, or **Melon Tree** (*Carica papaya*), an herbaceous tree (Papayaceæ) cultivated in most tropical countries for its fruit. It grows to a height of 25 or 30 ft. and resembles the palm in general appearance. The fruit is oblong, about ten inches in length, with a thick rind like that of a melon, but of an orange color. It is boiled when unripe and eaten as a vegetable; in its ripe state it is a favorite breakfast dish in tropical countries and is also used as a salad and as a dessert, and is crystallized.

**Pape, Eric** (1870-1938), American artist, was born in San Francisco, Cal. In 1898 he founded the Eric Pape School of Art. He designed a large monument to commemorate the founding of Massachusetts Bay Colony, at Gloucester, Mass. Among his best known works are illustrations for Lew Wallace's *Fair God*, a series of portrait drawings for

Ellen Terry's *Memoirs*, *The Two Great Eras*, *A Grey Day off Wheeler's Point*, *Early Morning at Annisquam*, and many portraits.

**Papeëte**, town of the Society Islands on the n.w. coast of Tahiti, of which it is the capital. It has a fine harbor, palace, cathedral, courthouse, and the residence of the French governor. Pearls and mother-of-pearl are important products; p. 3,600.

**Papen, Franz von** (1879- ), German diplomat, who came into prominence in the Hitler regime, when he was sent in the summer of 1933 on missions to the Vatican which resulted in the signing of the Concordat of July 20, 1933; again, when in the 1933 autumn elections, his name was on the ballot for his election as Vice-Chancellor, he being the only non-Nazi to hold high office in the new government; again in June, 1934, when in an address to Marburg students he spoke in criticism of certain features of the Hitler regime, a speech followed shortly by the 'Nazi purge' in which von Papen was held a virtual prisoner in his house, and was reported to be saved from punishment if not death only by the intervention on his behalf of President von Hindenburg. Following this crisis he was sent to Austria, after the Dollfuss assassination, as diplomatic representative of Germany.

**Paper** has been defined as an aqueous deposit of vegetable fibre, chemically treated so as to render it useful for the purposes for which it is required. The art of making paper appears to have been known to the Chinese and Japanese from very early times. It was kept secret for several centuries by the Chinese, but at the end of the 7th century, as the result of a raid by Moors and Arabs, the secret was wrested from them and imparted to their captors. The first paper-mill in America was erected near Philadelphia in 1690. Up to the beginning of the 19th century every sheet of paper had to be made laboriously by hand. The credit of introducing a successful paper-making machine belongs to Henry and Sealey Fourdrinier. In 1821 drying cylinders were added to the Fourdrinier machine, which, up to this time, had contained no drying apparatus.

Paper is made from various plant fibres; in the early days of the industry, almost invariably from one of the discarded textile fabrics, particularly cotton and linen, technically called 'rags,' and including worn-out garments, cuttings, and waste from looms. Later it became necessary to find additional sources of supply, of which the straw of cereals, the

fibre obtained by disintegrating wood, jute, bamboo, flax, hemp, and esparto or alfa grasses of Spain and North Africa, are the chief. The highest grades of paper—amounting to possibly 5 per cent.—are still made from linen and cotton, and possesses greater durability than those obtained directly from fibre-yielding plants. Plant fibre, when pure, is a white, semi-opaque substance, insoluble in all ordinary solvents, and chemically known as cellulose. This, from whatever source it is obtained, possesses the same chemical composition, but has physical and microscopic characteristics peculiar to the plant from which it is derived. In all cases the cellulose requires to be freed from other substances which have been incorporated with it during the growth of the plant.

After the material has been reduced from its original substance—rags, wood, or other cellulose fibres—to pulp (or, technically, to 'half-stuff'), it is treated with a bleaching solution. Then comes a process of breaking or beating up the 'half-stuff' with a quantity of water. The object of the beating operation is to obtain a certain character for the fibre according to the kind of paper required: as long-drawn-out pulp of great strength in some cases, and short tubes in others. The texture, strength, and regularity of the paper depend very largely upon the skillful treatment which the pulp receives at this stage. The coloring matters are added during this process of beating, as well as any filling or loading substances. The latter consist of certain finely divided and inert mineral bodies, such as pure China clay or calcium sulphate, and are used to fill up the interspaces between the fibres, and to assist in imparting a more solid surface to the paper, especially in the case of fine printing papers for half-tone photo-mechanical blocks.

The demand of printers for a paper having a very close surface has led to the coating of paper with an emulsion containing a large proportion of such mineral matters as are used as fillers. It is then dried and calendered. The sizing materials necessary for the production of an engine-sized paper are also added to the pulp during the process of beating. Such are the main features of the process of manufacture, listed only in their simplest form; modern machinery has brought to the entire process many elaborations as well as combinations of the various stages, with resulting improvements both in quality and speed of production.

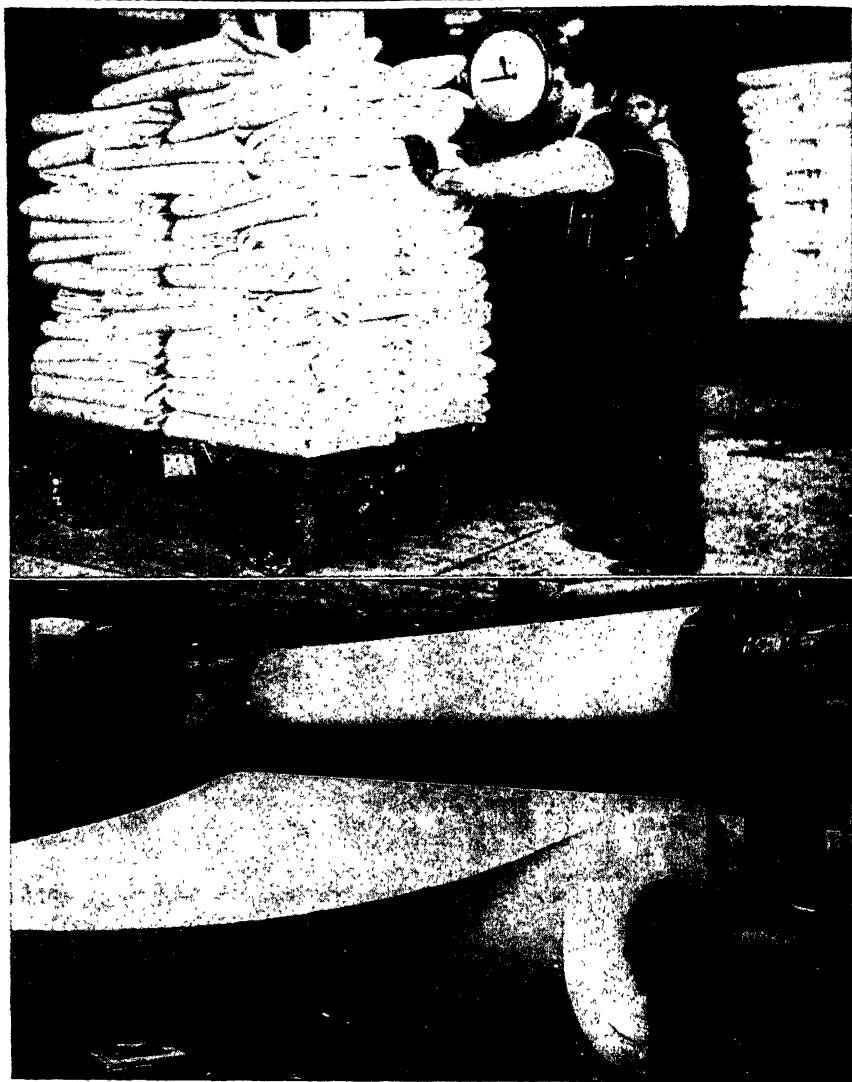
Different kinds of paper are made by us-

ing different kinds of raw stock and varying the processes to which they are subjected.

**Paper Money**, a medium of exchange adopted as a matter of convenience. The chief advantages of paper money over metallic money are its increased convenience and its greater economy. Costing comparatively nothing to produce, it is more portable than metal, though it is less durable. It may be either convertible or inconvertible. In the former case the authority issuing the paper undertakes to give coin in exchange when it is asked; in the later, no such guarantee is provided. Usually, it is given a lengel-tender quality, in the hope of supporting its value.

In the United States the issue of paper money dates from the Colonial period; the first important issue being that of Massachusetts, in 1690, of £7,000, soon increased to £40,000, to pay the soldiers who had served in the unsuccessful expedition against Quebec. This paper showed at first a tendency to depreciate, but an act making it receivable for taxes at a premium of 5 per cent. over silver soon brought it to par. The paper money was issued as a temporary expedient, and was redeemable in one year; but each year it was reissued, without providing any reserves for its redemption, until in 1750 it was worth only one-ninth of its face value. Other Colonies followed suit, some of them issuing paper even more recklessly—that of Rhode Island depreciating in 1750 to one-twenty-fifth of its face value. The precedent of Colonial issues was followed by the Continental Congress upon the outbreak of the Revolution. On June 22, 1775, the issue of \$2,000,000 was authorized. Congress did not make this money legal tender, but urged the Colonies to do so, and the recommendation was generally carried out. The States also issued paper money on their own account to the amount of \$209,524,776. By 1780 the ratio of paper to silver was 40 to 1; at this ratio the paper was received from the States by the National Government; \$119,000,000 was thus paid in, and destroyed. Under the funding act of 1790, the paper money was received in exchange for government stock at one per cent. of its face value; \$6,000,000 was thus received and destroyed.

After the adoption of the Federal Constitution, Treasury notes were used; and although not paper money they paved the way for the errors of the Civil War. The need for an immediate revenue led to the act of Congress of Feb. 25, 1862, authorizing



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#### *Paper Making.*

Upper, Paper being weighed before going to Beating Machines. Lower, Rolls of Paper (147 inches wide) as they come from the machine before being cut into Smaller Rolls.

\$150,000,000 of legal-tender notes. Another \$150,000,000 was authorized on July 11, 1862; by acts of Jan. 17 and March 3, 1863, the total was increased to \$450,000,000. Depreciation was at first gradual, but in December, 1864, a dollar in paper was worth only 35 cents in gold. The value of the paper money gradually appreciated after the close of the war, with improved hopes of redemption. The passage of the act of 1875, providing for the resumption of specie payments by the government in January, 1879, led to the collection of a gold reserve, so that resumption ensued on the date prescribed by the act. Immediately after the war it was expected that the paper money would



be retired; but it was 1878 before the entire matter was cleared up, and the volume of paper currency in circulation was fixed.

Since 1879, the United States notes present a case of convertible paper. Redemption of the United States notes (greenbacks) and the Treasury notes of 1890 (used to buy silver) was further provided by the act of March 14, 1900, which has remained in effect unchanged for many years. Under its provisions a reserve of \$150,000,000 in gold is held in the treasury. If paper money is presented for redemption in sufficient quantity to reduce the reserve below \$150,000,000, such paper may not be paid out again except

customs duties and are payable for all debts of the United States except interest on the public debt and in the redemption of United States and Treasury notes. The Federal Reserve Act of 1913 authorized the regional reserve banks to issue and circulate Federal Reserve bank notes covered by commercial paper deposited with the Federal Reserve Agent, equal to the face value of the notes, and further guaranteed by an authorized gold reserve held in each regional reserve bank equal to 40 per cent. of the issue. The reserve notes are a prior claim on assets of the bank, and are redeemable at par by the national treasury as a further guarantee on



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Pará, Brazil: Market Boats.

in exchange for gold. If the gold reserve fall below \$100,000,000, the Secretary of the Treasury must sell bonds to restore it to \$150,000,000. Through these provisions all reasonable doubt as to the convertibility of the paper money is removed.

By the National Bank Act of Feb. 25, 1863, and by later amendments, national banks are allowed to issue and circulate national bank notes the redemption of which is guaranteed by Government bonds owned by the bank and deposited with and controlled by the Government. These notes are partially legal tender, as they are receivable at their face value by all national banks and by the Government in payment of all dues except

the part of the government. See BANKING: UNITED STATES; CURRENCY; FEDERAL RESERVE BOARD; INFLATION; GOLD; and UNITED STATES HISTORY: THE NEW DEAL.

**Paphlagonia**, a country of Asia Minor, between Pontus on the e., Bithynia on the w., and the Euxine Sea on the n. Its inhabitants, allies of the Trojans in the Trojan War, were subdued by Cræsus during the 6th century B.C.; finally they came under Roman rule.

**Paphos**, the name given to two cities on the western coast of Cyprus—the older (now Kuklia) about a mile from the sea, and the newer (now Baffo) about 7 m. to the w. They were founded by Greek colonists about 1050 B.C.

**Papier Maché**, a material made chiefly from old paper by boiling to a pulp with water, pressing, mixing with glue or starch paste, and then forcing in a mould previously oiled. After drying, the articles are soaked in linseed oil, and then dried at a higher temperature. It is chiefly used for small articles, such as trays, or for decorative features in house building.

**Papin, Denis** (1647-1712), French natural philosopher and physicist, was born in Blois. He was curator of the Royal Society (1684-8). He was the first to produce motive force by the raising of a piston thrust upwards by steam—a close approximation to the principle of the steam-engine. This he applied successfully as the motive power for a paddle-wheel in a vessel on the Fulda in 1707.

**Papini, Giovanni** (1881- ), Italian philosopher and writer, was born in Florence. He founded the review *Leonardo*. In the United States he is best-known for his *Life of Christ* (1921).

**Paprika**, a condiment derived from the pungent peppers of the genus *Capsicum*. It is aromatic and highly colored, usually of a bright red shade, and is often used for seasoning.

**Papua**. See **New Guinea**.

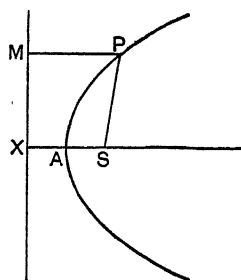
**Papyrus**, a genus of tropical aquatic sedges belonging to the order *Cyperaceæ*. One species, *P. antiquorum*, the Egyptian paper reed, is occasionally cultivated as a subtropical aquatic, being removed within doors in autumn. It is a graceful plant, with long, green, jointless stems surmounted by beautiful pendent leaves. The pith of the larger stems, cut into strips and pressed together, constituted the papyrus or paper of the ancients, upon which their official and ordinary correspondence, accounts, contracts, and the like were written. The oldest extant specimens date from about 3500 B.C.

**Pará, or Belem**, city, Brazil, capital of the state of Pará, on the Pará River, 80 m. s. of its mouth in the Atlantic Ocean. The city has narrow streets, but its white buildings and tropical foliage make it very picturesque. A naval arsenal is situated here. The harbor is deep and commodious, and, as the chief port of North Brazil and the Amazon, carries on an important trade. It is one of the leading ports in the world for the export of rubber; p. 279,491.

**Parable**, a brief narrative founded on real scenes or events and usually having a religious application. It belongs to the class

of metaphorical and fictitious utterances or narratives, of which we have other examples in the simile, the fable, the myth, and the allegory. In Scripture the name is given to stories founded upon common experience, and designed to set forth spiritual truths, like those told by Jesus.

**Parabola**, a plane curve such that any point on it is equidistant from a fixed point, *s*, the focus, and a fixed straight line, *MX*, the directrix. (See figure.) If *p* be any point on the curve, and *PM* is drawn perpendicular to the directrix, *SP* = *PM*.



*Parabola.*

**Paraboloid**, a surface traced by a parabola which moves so that its vertex is always on another parabola. The planes of the parabolas are supposed to be at right angles to each other.

**Paracelsus**, or **Philippus Aureolus Theophrastus Bombastus von Hohenheim** (1493-1541), Swiss physician and naturalist. Discarding the antiquated practices of his profession, he emphasized the importance of direct observation of nature, and was the first to put forward the doctrine that the life processes are chemical, and that therefore we must look to chemistry for the remedies for disease. In pursuit of this idea he discovered hydrogen, and introduced many chemical remedies. See Browning's poem *Paracelsus*.

**Parachute**, a device by means of which an object falls with maximum drag. It is designed to open and take the shock of a free fall at maximum speed (175 ft. per second). Its history dates from Leonardo da Vinci.

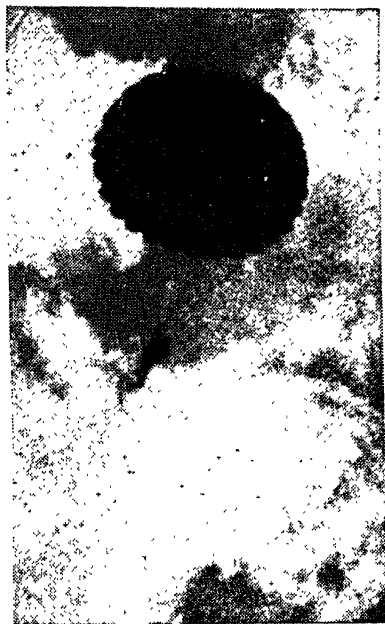
**Parachute Troops**, or **Paratroops**, developed early in World War II, are ordinarily the advance guard—the surprise force—of the army. They were used with outstanding success by Russia and Germany.

**Paraclet**, farm, Aube department, France. Here Abélard, in 1129, founded the Benedic-

tine abbey, of which he made Héloïse abbess.

**Paraclete.** See **Holy Spirit**.

**Paradis, Grand**, the culminating point (13,324 ft.) of the Italian or East Graian range of the Alps, rises s. of Aosta, between the valleys of the Dora Baltea (n.) and the Orco (s.).



*Parachute in Use.*

**Paradise** (Greek *paradeisos*, 'a park,' 'pleasure ground'; originally an Oriental, apparently a Persian word), the Garden of Eden, heaven. By New Testament times it had come to signify an ideal locality, practically equivalent to heaven.

**Paradise, Bird of.** See **Bird of Paradise**.

**Paradise Fish**, a domesticated variety of a species of *Polyacanthus*, a genus of Asiatic fresh-water fishes related to the climbing perch. It has been kept in confinement by the Chinese for a prolonged period. It is of a bright golden color with transverse red bands, and is further remarkable for the long forked tail and the elongation of the rays of the dorsal and anal fins.

**Paradise Lost.** See **Milton, John**.

**Paradox**, a statement which appears at first sight contradictory either in itself or to our ordinary notions of the matter in question, often simply a device, legitimate enough, for illuminating with a sudden flash

a neglected aspect of a subject, or for clinching an argument with a memorable phrase.

**Paraffin**, a brilliant white solid, a mixture of the higher aliphatic hydrocarbons, without taste or odor, soluble in ether, mineral spirit, carbon bisulphide and olive oil, insoluble in water or acids, plastic for some interval below melting point, a clear, mobile, thin liquid when fused. With a wick it burns with clear white smokeless flame but it does not burn easily in mass. Its melting point depends on its composition, varying (in the marketed varieties) from 38° to 57° c. The uses of paraffin are constantly being extended.

**Paraffins**, a series of saturated hydrocarbons having the general formula  $C_nH_{2n+2}$ , and constituted in open chains. They vary from gases, such as methane, through very volatile liquids like the pentanes and hexanes, to heavier and more viscid liquids, while the members of the series of highest molecular weight are solids at ordinary temperatures. Chemically they are extremely inert, being acted on only by the halogens with difficulty; but they are inflammable, and burn with luminous flames.

**Paraguay**, an inland state of South America, lying between lat. 20° 16' and 26° 31' s. and long. 54° 37' and 62° w., bounded by Bolivia, Brazil and Argentina, comprises about 154,000 sq. m., since adjustment of Gran Chaco boundary question formerly in dispute with Bolivia. Next to Uruguay it is the smallest South American state. The surface of Paraguay proper is generally hilly, but with no striking elevations. The cordilleras of Amambay and Mbaracayu, an extension of the Brazilian highlands, follow the eastern boundary, and a series of lesser hills run from n. to s. through the center. The Chaco, largely unexplored, is, in general, a vast plain, dry in the interior, and swampy along the river banks. It is largely covered by palm groves, forests of hardwood, and open pampas. Two great rivers with their tributaries water the country—the Paraná and the Paraguay.

The temperature in summer ranges from 55° to 108° F.; in winter it sometimes falls to 40° F and slight hoar frost has been known, though rarely. The climate is similar to that of Southern California. Botanically as well as geographically the Republic is divided into two sections by the Paraguay River. In the e. vegetation is luxuriant, dense forests of lofty trees, tangled underbrush, and brilliant flowering plants being interspersed with broad tracts of fertile grass

land. West of the Paraguay woodlands give way to vast level stretches of prairie, with scattered palms and occasional forests of quebracho. Wild animals are numerous, and include the jaguar, tiger cat, aguara-guazu, and species of marten, bear, tapir, peccary, armadillo, and deer. These are large numbers of brilliant song birds and of venomous snakes. Crocodiles frequent the rivers, and fish are a valuable food product.

Abundant deposits of iron, manganese and other minerals are but little exploited. Copper, coal, kaolin and marble occur. Paraguay is an agricultural and cattle-raising country. It is self-sufficient in food except wheat. The chief crops are tobacco and maté. Oranges, sugar, beans, white potatoes, bananas, rice, castor beans, sweet potatoes, ground-nuts, alfalfa, maize, cotton, coffee, cassava, and peanuts are produced. Two-thirds of the area is in forests of hard and soft woods. Stockraising is the chief industry, especially in the western plains, where cattle, horses, sheep, goats, and hogs thrive.

In 1933, a British-owned railway (232 m.) ran from Asunción to Villa Encarnación, where connection was made without break to Buenos Aires. Another railway from Concepción to Horqueta (33 m.) was to be extended to the Brazilian border. Total railway mileage was 669. Most of the traffic is by river, the Paraguay being navigable to Villa Concepción for vessels of 12-ft. draft and for smaller craft for 1800 miles. There is telephone service, telegraph, and wireless, and there is air-service to Buenos Aires. The leading exports (over \$1,000,000 each) are quebracho, preserved meat, hides, tobacco, maté, and meat extract, named in order of value. The principal imports are textiles, foodstuffs, metals and manufactures of same, and petrol.

The estimated population of Paraguay is 1,000,000 including some 67,500 Indians (15,000 in the Chaco). The people are mostly of pure European descent, chiefly Spanish, with a few *mestizos*, a cross between the Guaraní Indians and the early Spaniards. They are bilingual, Spanish being the official language and *Guaraní* the common speech. The chief towns are Asunción, the capital (p. 91, 156), and Villa Rica. The State religion is Roman Catholic; freedom of worship is permitted. Education is free and compulsory but the law is not enforced everywhere due to lack of schools. There is a national college, a school of commerce and a university at Asunción, and there are several normal schools.

The constitution of Paraguay provides for a centralized republican form of government consisting of the National Congress, the President, and his Cabinet. Paraguay was explored by Juan de Ayolas in 1536; Asunción was founded by Juan de Zalabar y Espinosa in 1537 and the country was shortly afterward established as a province of the viceroyalty of Peru. The Jesuit missionaries maintained political and religious ascendancy from 1609 until their expulsion in 1767. In 1810 it joined with the other states in declaring independence of Spain and in 1811 proclaimed its independence. From 1814 to 1870 dictators ruled.

A new constitution was proclaimed in 1870. Numerous revolutions occurred and a virtual succession of dictators up to 1913 prevented real progress. Thereafter a more stable government permitted Paraguay to double its foreign trade between 1913 and 1929. Foreign capital from Argentina, United States and England aided development; railways, telegraph and telephone were introduced; schools were inaugurated; the population increased 20 per cent., and agriculture progressed. In 1923, the country's finances were reorganized under an American adviser. In 1927 the Jesuits were allowed to return.

In 1932 Paraguay declared war on Bolivia after 11 months of fighting in the Gran Chaco. Each made claims to the region, based on Spanish colonial documents. Paraguay occupied it, claiming that Bolivia was the aggressor. The two nations had been at odds over the question for half a century. In 1913 they agreed to negotiate but the efforts of the Commission of Neutrals of the Pan American Union was unable to effect a compromise. The dispute was still unsettled at the beginning of the year 1935, but cessation of hostilities was brought about when, under the influence of a conference composed of representatives of Argentina, Brazil, Chile, Peru, Uruguay and the United States, an armistice was signed on June 12, 1935, and a treaty of peace on July 21, 1938. At the Pan-American Conference in Jan., 1942, Paraguay became one of the United Nations. See also CHACO. Consult F. A. Borden *Paraguay* (1932); Pan American Union, *Paraguay*.

**Paraguay River**, South America, an affluent of the Paraná, rises in the Brazilian state of Matta Grosso. The river pursues a generally southward course, forming from 20° to 22° s. the boundary line between Brazil and Bolivia, thence flowing s.w. through

the territories of Paraguay to its junction with the Paraná. Except in the marshy districts, the country on both banks of the river is rich and fertile, and abounds in excellent timber. Total length, 1,800 m.

**Paraguay Tea.** See **Maté Tea.**

**Parahyba**, the easternmost state of Brazil, has an area of 28,846 sq.m. Cotton, coffee, sugar, rubber, hides, castor seed, oil and tobacco are the chief products; p. 1,322,069.

**Parahyba**, capital of Parahyba state, Brazil, on the Parahyba River, has a good harbor (Cabedello) and important trade; p. 74,104.

**Parahyba River**, Brazil, in Parahyba state, flows into the Atlantic by an estuary in lat.  $7^{\circ} 8' S.$ , after an easterly course of 270 m. Cabedello, the chief port is 11 m. above its mouth.

**Paraldehyde** ( $C_6H_{12}O_3$ ), a colorless liquid, formed by treating ethyl aldehyde with sulphuric or nitric acid, and used in medicine as a hypnotic.

**Parallax**, an apparent displacement of a remote object due to the shifting of the point of view. Its measure is the angle contained between the different directions of the visual ray, from which the linear distance of the



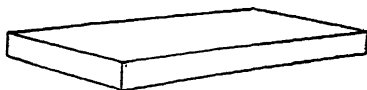
'Parallactic Ellipse' of a Star.  
s, Sun; s, star; AB, earth's orbit; C, ap  
parent path of star.

observed body can be inferred when the base is of known length. By this means the scale value of the solar and sidereal systems has been determined. The base line employed is either the equatorial radius of the earth or the mean radius of the terrestrial orbit. In the first case the angle to be ascertained is called *Diurnal Parallax*; in the second, *Annual Parallax*.

*Diurnal parallax* is the seeming difference in the position of a heavenly body as seen from the center and from the surface of the earth. It can be determined by simultaneous observations from remote parts of the earth, or by successive observations from the same spot; and the actually measured perspective shift is expressed in standard terms by being 'reduced' to the horizon and the

equator. Thus, the mean parallax of the moon is  $57.2'$ , which corresponds to a distance of 60.3 times the earth's equatorial radius, or 238,840 m. Only indirect methods are available for the determination of the sun's parallax. Annual *parallax*, or *heliocentric parallax*, is the difference in the direction of a heavenly body as seen from the earth and the sun. It is the angle under which the mean radius of the earth's orbit appears at the distance of the scrutinized star.

**Parallelepiped**, a solid figure bounded by six faces, which are parallelograms. The 12 edges are both parallel and equal in three sets of four, and the diameters meet in a point. The volume of a parallelepiped is the area of any face multiplied by the perpendicular distance between that face and the opposite one. The cube is a particular case of this solid.



*Parallelepiped.*

**Parallel Forces** are forces which act in parallel lines, such, for example, as the weights of the portions that make up any framework or structure on the earth's surface. With the exception of a particular case, the couple, parallel forces have always a single resultant, which is readily found by the method of moments.

**Parallelogram of Forces** is the geometrical rule by which the resultant AC of two given forces AB, AD acting through a point A can be found. The resultant is represented by the diagonal of the parallelogram of which the sides represent the two forces. The same rule applies to displacements and velocities, and to any vector quantity.

**Paralysis.** The term signifies inability to contract voluntarily one or more muscles. When paralysis is incomplete, the term  *paresis*  is usually employed. Paralysis may result from disease or defect in the cerebral center which dominates the muscle; from defect of the nerve trunks along which impulses pass; or from changes in the peripheral nerve to respond to its normal stimulus. *Cerebral Paralysis* often follows an apoplexy or it may result from such an injury as fracture of the skull, or its onset may be gradual from the growth of a tumor. *Spinal Paralysis* is the result either of pressure upon the spinal cord, of disease of the spinal cord itself, or of di-

rect injury to the spinal cord. It is usually characterized by implication of both sides of the body, the extent of the paralysis depending upon the height of the spinal lesion.

*Peripheral Paralysis* may be due to pressure upon, injury to, or disease of the nerves. The most common of these diseases are the inflammations arising from cold, from the excessive use of alcohol, or from exposure to the poison of lead. After a shock of paralysis temporary rigidity of the muscles may set in, but this is soon followed by flaccidity. Should the paralysis be long continued, the muscular fibres atrophy and are replaced by connective tissue, which gradually contracts, so that a paralyzed limb becomes immobile and flexed.

**Paralysis, Infantile.** See *Infantile Paralysis*.

**Paramaribo**, town, capital of Dutch Guiana, South America, on the Surinam River. It is a clean town, with broad streets, lined with trees and traversed by canals. Vessels drawing 16 ft. can ascend the river. Coffee, cocoa, rubber, sugar and rum are exported; p. 47,791.

**Paramœcium**, or *Slipper Animalcule*, a minute infusorian, common in pond water or in vegetable infusions. It is oval or slightly slipper shaped, and reaches a length of about 1-100 of an inch. The surface of the cell is covered with rows of cilia, which drive the tiny organism through the water, and are also so arranged as to force particles of food into the slit in the protoplasm which serves as mouth. The ordinary method of reproduction is by transverse division.

**Paraná**, a southern state of Brazil, on the coast, with an area of 85,453 sq. m., and a population of 974,273, including several colonies of Germans and Italians. The capital is Curitiba; p. 100,335.

**Paraná**, capital of Entre Rios province, Argentina, on the Paraná River. It was the capital of Argentina from 1852 to 1861, and is now the residence of a bishop and the seat of a university. It is the center of a fertile district, and has colonies of Germans, Swiss, and Italians; p. 62,637.

**Paranaguá**, chief port of Paraná state, Brazil; p. 22,000.

**Paranahyba River**, of Northeast Brazil, rises in Serra das Mangabeiras, flows some 800 m. n.e. between Maranhã and Piauhý states, and enters the Atlantic by a delta beyond the town of Paranahyba.

**Paranahyba River**, in Southern Brazil,

forms part of the boundary between the states of Goyaz and Minas Geraes, and unites with the Rio Grande to form the Paraná.

**Paraná River**, South America, is formed by the Rio Grande and the Paranahyba Rivers, which rise in the Brazilian state of Minas Geraes, and unite at lat. 20° s.; at 25° 30' the Paraná enters Argentine territory. It is navigable by steamers up to the Brazilian frontier, with occasional interruption at the Apípe rapids, 780 m. from Buenos Ayres. Some fifteen m. above Corrientes it is joined by the Paraguay. The entire length of the river is about 2,100 m.; it drains an area of more than 1,100,000 sq. m. The principal towns on its banks are Corrientes, Paraná, Santa Fé, and Rosario—all Argentinian.

**Paranoia**, a chronic delusional form of insanity. While paranoia usually develops between the ages of twenty-five and fifty, indications of its existence are often present at an earlier age, especially in the so-called higher degenerates. Intense egotism, selfishness, conceit, overbearing pride, violent temper, and moroseness are among these early manifestations. Actual paranoia may be ushered in by such bodily symptoms as headache, tinnitus, palpitation, digestive disturbances, and incapacity for mental exertion. Eventually the subject develops one or more of the characteristic delusions of the disease; persecutory, religious, erotic, litigious, and ambitious or grandiose, the persecutory predominating, and frequently occurring in association with the other types.

**Parapet** (Italian *para-petto*, from *parare*, 'to protect,' and *petto*, 'the breast'), a wall raised higher than the gutter of a roof for protection; in military works, for defence against missiles from without; in domestic buildings, churches, etc., to prevent accident by falling from the roof.

**Paraphernalia** is, generally, miscellaneous articles of equipment or adornment. As a legal term it refers to the articles reserved to a wife over and above her dower or marriage portion, as apparel and ornaments suitable to her rank and condition in life.

**Paraphrase**, a restatement of a text or passage, giving the sense of the original in other words, generally in fuller terms and with greater detail, for the sake of clearer and more complete exposition.

**Parasang**, a measure of travel among the Persians, which indicates the amount of time consumed in covering a certain distance, rather than the actual distance itself.

**Parasites**, or *Parasitic Animals*, organ-

isms which live at the expense of other organisms, called the hosts. Parasites temporarily or permanently attached to the outer surface of their hosts are termed *ectoparasites* (*Ectozaa*); while if living within their hosts, they are described as *endoparasites* (*Endozaa*). Parasites which feed entirely upon the tissues of their hosts must be carefully distinguished from commensals, which share the food of their hosts, but usually give something in return.

Among animals parasitism occurs in a great number of invertebrate classes, and there is every grade of adaptation, from forms such as mosquitoes, in which the females only are blood suckers and therefore parasitic, to forms such as the tapeworm, which alike in structure and in life history are perfectly adapted to the parasitic mode of life. Where parasitism is pronounced, locomotor organs tend to be absent: thus, among insects, fleas, bugs, and aphides exemplify the loss of wings; among flat worms, flukes and tapeworms illustrate the loss of cilia; and so forth.

It is a general characteristic of parasites that they possess organs by means of which they attach themselves to their hosts—the hooks and suckers of the tapeworm, the suckers of leech and fluke. The environment of the parasite is necessarily limited, and in consequence there is no need for elaborate sense organs or well-developed nervous system, both of which are in most cases markedly degenerate. Food is not only abundantly supplied to the parasite, but is presented in a more or less soluble condition. In consequence the alimentary tract tends to undergo degeneration. Every parasite, every internal parasite especially, must possess some means of defence from its host. In the case of bacteria the same host offers at different times a varying degree of resistance to the same parasite.

**Parasitic Plants** are those which derive their nourishment wholly or in part from the plants or animals which they infest. Parasites occur in many orders among the flowering plants, and the fungi (including the Bacteria or Schizomycetes) are either parasitic or have gone a step further, and live, as saprophytes, on decaying organic matter. Nearly all parasites have a marked preference for a particular species of host. The Bacteria have animals as their hosts, and cause in them many diseases, the species being often recognized by the disease. The Fungi are many of them a trouble in agri-

culture, causing corn, hop, and vine mildew, potato disease and salmon disease; others, like the mushroom, are saprophytes. See BACTERIA; FUNGI; SYMBIOSIS.

**Parcel Post.** See **Post Office**.

**Parchment**, a writing material. Ordinary parchment is chiefly made of sheep skins, but those of calves and goats are also used. Fine parchment and *vellum* are prepared from the skins of kids, lambs, and young calves. A coarser parchment for drumheads, tambourines, etc., is manufactured from the skins of male goats, wolves, and calves. For bookbinders' use a parchment is sometimes prepared from pigskin. The early stages in the manufacture of parchment are similar to those used for leather. Parchment is said to have been invented by Eumenes II. of Pergamum, the founder of the celebrated library there, about 190 B.C.—the material being named *pergamena* (prepared at Pergamum); hence the word 'parchment.' From about the 10th century till ordinary paper became available in the 14th century, parchment was almost the only material employed for writing purposes. Some of the earliest printed books were done on vellum.

**Pardo Bazan, Countess Emilia** (1851-1921), principal Spanish woman writer of the past century, was born at Corunna. Her best works are those describing the life of her native province Galicia, such as *De mi Tierra*.

**Pardon**, in the legal sense, is an act by which an individual or class of individuals is freed from the consequences of a breach of the law already committed. The Constitution of the United States confers on the President 'power to grant reprieves and pardons for offences against the United States, except in cases of impeachment.' Under most State constitutions this power is exercised by the governor, though sometimes the consent of the legislature or one of the legislative houses or the executive council is required. A number of States have established *boards of pardon* consisting, as a rule, of certain of the highest executive and judicial officers.

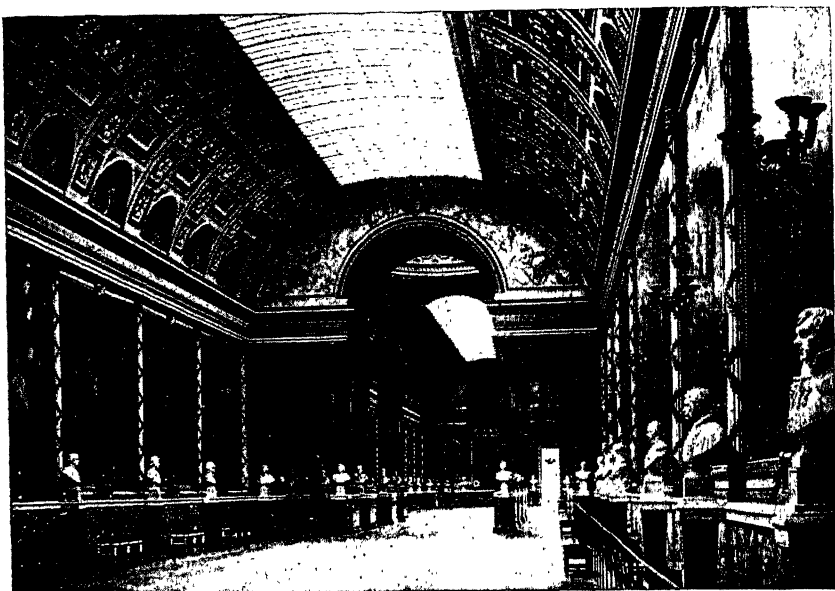
A pardon may be *absolute* or *conditional*. If no restrictions are imposed it is, of course, absolute, but it may be granted upon some condition, as, for example, that the convict leave the state forever. A conditional pardon becomes void if the convict violates its restrictions. A pardon is to be distinguished from commutation of sentence, which does not restore rights, but only lessens punishment; and from a reprieve, which is simply

a suspension of the execution of sentence for a certain time.

**Pardubitz**, town, Czechoslovakia. situated on the Elbe. Brewing, distilling, saw-milling, and iron-founding are carried on. Pardubitz has famous horse fairs; p. 25,000.

**Paré, Ambroise** (c. 1510-90), French surgeon, styled 'the father of French surgery.' In the treatment of gunshot wounds, which previously were cauterized with boiling oil, he substituted the ligature of arteries. His many writings on surgical matters have had great influence.

becomes the legal guardian and has custody of the children. This natural right of guardianship extends in most States only to control of the person of the child, and not to management of his property. If the parents separate, the question of custody of the child may be determined by the proper court. Even where it is provided by law that the parents must provide necessities for their children, however, the question of what constitutes necessities is one of fact and must be decided in each case. A father, and it would seem a mother when she acts as guardian



*Elmendorf Photo, © Ewing Galloway, N. Y.*

*Palace of Versailles: Gallery of Battles.*

**Paregoric**, a camphorated tincture of opium flavored with aromatics. It contains two grains of opium to the ounce, and should never be administered to children.

**Parent and Child.** The natural relation of parent and child depends, of course, upon the fact of parentage, but the legal relation depends upon legitimacy. Speaking generally, bastards are legally strangers to their parents and to each other, but the natural tie is recognized for some purposes. During his lifetime the father is the natural guardian of his children, and unless the right be given by statute to the mother the father may by will name any proper person he pleases to act as guardian and his wishes will be enforced. If he does not name anyone else, the mother

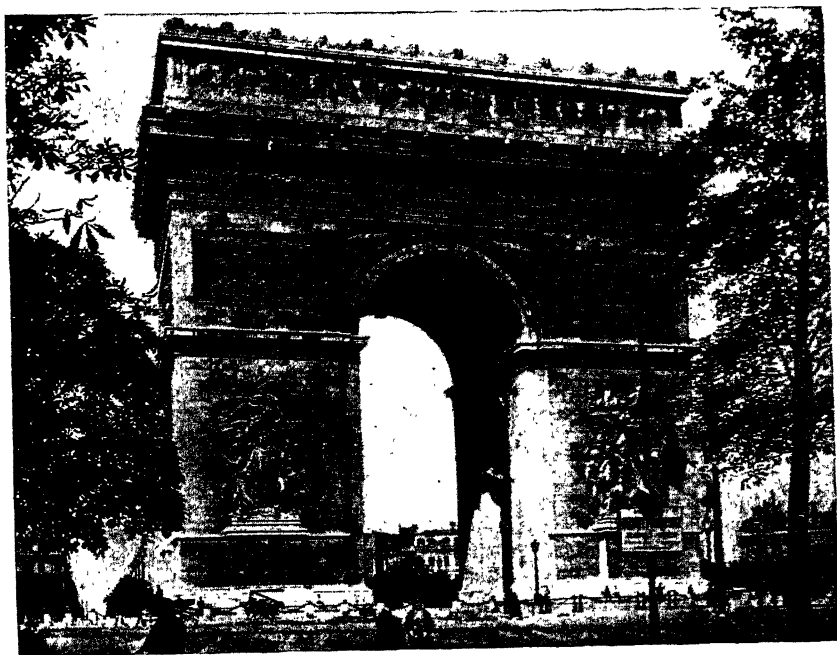
after the father's death, has a right to the services of the children and to their earnings. When a child has been allowed to leave home and keep its earnings, the child is held to be emancipated and may claim what it earns as its own. Marriage of either a minor son or daughter is generally held to emancipate him or her from the parent's control and right to earnings. If a child has property in its own name this may not be used even for the child without an order from the court having jurisdiction in the matter. Where there are no compulsory education laws parents are not obliged to educate their children. A father is not liable for the contracts of his child even for necessities, but the minor himself may be held liable for necessities contracted for.



A father may bring an action for the seduction of his daughter; this is based upon the theory of loss of services. Parents may also institute an action to have the marriage of minors annulled. In the absence of statute a child is not bound to support its parents, but in many States there are statutes requiring a child to keep its parents from becoming a public charge.

**Pariah**, more correctly **Pahari** ('hillmen'), the aboriginal tribes who refused to accept Brahmanism, but clung to their own forms

on both banks of the Seine, about 90 m. from the sea. Paris is divided by the Seine into two unequal parts, with two islands, Ile St. Louis and Ile de la Cité, near the center of the city. On the right or north bank are most of the leading hotels, restaurants, theatres, clubs, and shops. On the south or left side of the river, comprising more than a third of the city's area, is the Latin quarter containing the learned, artistic and scientific institutions. The suburbs of Paris include St. Cloud, Sèvres, Versailles, St. Germain en



*Elmendorf Photo, © Ewing Galloway.*

#### *Arc de Triomphe.*

Beneath this arch rests the body of an Unknown Soldier, representative of the heroic dead in World War I.

of faith, were classed as the 'out-caste' races, and are now commonly spoken of in Southern India as 'pariahs.'

**Parini, Giuseppe** (1729-99), Italian poet. Parini reformed Italian poetry by imparting to it a deeper and more moral tone than had distinguished it for ages; his masterly use of blank verse was a revelation to the Italians of that day. The *Odi* are excellent specimens of his craft; but his masterpiece is in the satire *Giorno* (1763-65).

**Paris**, capital and largest city of France, 4th city in the world in population, is situated

Laye, Malmaison, Argenteuil, Montmorency, Enghien, St. Denis, Vincennes, and Fontainebleau. The climate of Paris is generally equable and healthful. July and August are sometimes very warm; January is usually the coldest month, but the river seldom freezes. Rainfall is abundant.

The grand boulevards which are a feature of Paris enclose the very heart of the city in an oval space formed by an irregular semi-circle from the Place de la Concorde to the Place de la Bastille, on the north, and a somewhat smaller arc on the south. These boulevards

are lined with trees and seats and on most of the better ones are cafés, restaurants, shops, and theatres. The Bois de Boulogne, a park of 2,155 acres, contains the Longchamps race course, one of the greatest in the world, and the Jardin d'Acclimatation, founded to acclimatize useful foreign plants and animals. It is the favorite resort of Parisians, who frequent it by thousands.

The Tuileries Gardens overlooking the Seine are formal gardens of 63 acres. They extend from the Place du Carrousel to the Place de la Concorde. Westward from the Place de la Concorde to the Place de l'Etoile extend the gardens of the Champs Elysées, the most famous of the city's promenades. In the center of the Place de l'Etoile, from which radiate twelve magnificent avenues, stands the Arc de Triomphe, the largest triumphal arch in the world. There are several chief railways leading from Paris. Within the city itself transportation is provided by cabs, motor omnibuses, tramways, underground railways, the *Chemin de Fer de Petite Ceinture*, which encircles the city, and the Seine, which is much more of a highway in Paris than is the Thames in London. Small steamboats ply at frequent intervals between the piers on either bank of the river, and each side of the stream is bordered by spacious quays. In its seven-mile course through the city the river is spanned by thirty-two bridges, many of them imposing works of art.

On the north side of the river are the Opera House, a magnificent edifice and one of the largest theatres in the world; the Palais-Royal; the Louvre, with its famous collection of art treasures; the Bourse, or Stock Exchange, in the Palace de la Bourse, a beautiful building, resembling the Temple of Vespasian in Rome; the Banque de France, occupying a huge building northeast of the Palais-Royal; the Halles Centrales or Central Markets, at the northern end of the Rue du Pont Neuf. The Hôtel de Ville, between the Rue de Rivoli and the Seine, is one of the finest buildings in Paris. Near it stands the Tour St. Jacques, a graceful Gothic tower dating from 1508-22, long used as a meteorological station. The Madeleine, the most fashionable church in Paris, and the Palace of the Trocadéro, an Oriental looking building designed for the Exhibition of 1878, are among the more modern buildings. Across the river from the Parc du Trocadéro lies the Champs de Mars, laid out in 1770 as a parade ground, and made into a park in 1913. At its northern end stands the Eiffel Tower, 984 ft., one of

the tallest structures in the world. The Ile de la Cité, the oldest part of Paris, is in the river a little to the n. of the city. Here is the cathedral of Notre Dame, an example of pure Gothic, begun in 1163. Here too, is the Palais de Justice, an immense block of buildings occupying the whole width of the island. Within its walls are the Sainte Chapelle, a beautiful example of Gothic architecture, built in 1245-48; and the Conciergerie, one of the most famous prisons in the world, in which Marie Antoinette, Mme. Du Barry, Danton, Robespierre, Camille Desmoulins and others were confined, now used for prisoners awaiting trial.

On the left or south side of the river, in the Latin Quarter, are the Ecole de Médecine, the Sorbonne, the seat of the University of Paris, and the Panthéon, an imposing building in the shape of a Greek cross; the Palais du Luxembourg, once a royal residence and now the seat of the Senate, noted for its beautiful gardens; the Hôtel des Invalides founded by Louis XIV., covering an area of 31 acres; the Observatoire, the Gobelins, the famous tapestry factory owned by the State; the Institut Pasteur; and the Catacombs, a vast series of underground quarries. There are numerous churches, some centuries old; many institutions of learning in addition to those mentioned above; large libraries, the principal one being the Bibliothèque Nationale.

Foremost among the art galleries of Paris is the Louvre, with its unrivalled collection of sculpture, painting, and other art treasures, the special glory of which are perhaps the Venus de Milo and the Victory of Samothrace. The Musée de l'Armée in the Hôtel des Invalides is composed of two sections, one devoted to arms and armor, and the other to military souvenirs. The former department contains one of the most extensive collections of arms, offensive and defensive, in existence. The Musée du Luxembourg, occupying the former orangery of the Palais du Luxembourg, is devoted to the works of contemporary artists; the Musée de Cluny, in the Hôtel de Cluny, has a large collection of ancient arts and crafts; the Musée Guimet, in the northwestern part of the city contains fine collections pertaining to the Far East, particularly Oriental china. There are many other galleries and museums. The Ecole des Beaux-Arts holds annual competitions for the Grand Prix de Rome.

Paris has over twenty large theatres, besides many small ones, and numberless mu-

sic halls and cafés-chantants, as well as cabarets, cinematographs, and concert halls. The leading theatres are the Théâtre Français, which forms one of the wings of the Palais-Royal; the Odéon, devoted chiefly to classical drama; the Opéra, the magnificent home of French opera; and the Opéra-Comique. These four theatres receive state subsidies and their actors are engaged for long periods. Among the better known music halls and cafés-chantants are the Folies-Bergère, the Casino de Paris, Jardin de Paris, Théâtre Marigny, the Alhambra, Moulin Rouge, Les Ambassadeurs, Quatz' Arts, La Lune Russe and others. Public balls such as the Bal Tabarin and Bal Bullier are popular. The Conservatoire de Musique, for orchestral music, the Théâtre du Chatelet, Salle Gaveau and Salle Pleyel for chamber music, and the gardens of the Tuileries, Luxembourg, Palais-Royal and Jardin d'Acclimatation for open air concerts are the chief musical centers.

The most fashionable and expensive hotels are situated in the vicinity of the Place de la Concorde, Place Vendôme, and the Champs-Élysées. Among them are the Ritz, Meurice, Brighton, Du Rhine, Mirabeau, Langham, Carlton, Majestic, Mercèdes, Grand, Continental, St. James and Albany, Chatham, and Lutetia. Cafés and restaurants are numerous, and most of the streets and boulevards are lined with small tables set out under awnings, at which in favorable weather hundreds of people sit at all hours and in all seasons, eating, drinking and smoking. Famous restaurants are the Ritz, the Café de Paris, Café Voisin, Café de la Paix, Café Meurice, Ciro's, Café des Ambassadeurs, Café Gaurent, and Café du Pré-Catalan.

The present school system in Paris dates from the Third Republic. Ecoles maternelles, which receive children from two to six years old, are scattered throughout the city, particularly in the poorer quarters, where many of the mothers are obliged to be away all day, and here reading, writing and simple sums are taught. Ecoles enfantines, which are a sort of transition from the écoles maternelles to the primary schools, are for children from four to seven and are generally attached to one or other of those schools. The primary schools, for children from six to thirteen, with separate schools for boys and girls, are compulsory. Higher primary schools, providing two or three years of study, with special courses in agriculture, domestic science, and commerce, furnish sup-

plementary instruction to those pupils desiring it. There are evening schools for those unable to complete their education in the day schools, schools for backward or abnormal children, as well as lycées and colleges, which are similar to the American high school.

Paris, while the industrial center of France, is nevertheless rather the home of many small highly skilled workshops than of large industrial establishments. Gold and silver articles, millinery, perfumes, and artificial flowers are produced in abundance and of excellent quality. Book-publishing is one of the largest industries, and chemicals, soap, china, porcelain and machinery are also largely manufactured. The Port of Paris is accessible to small seagoing craft. The Port du Louvre is the recognized seaport, subject to custom house regulations. The population of Paris is about 2,891,000; of Paris with suburbs is about 3,783,000; with a density greater than that of any other European city. For purposes of administration Paris is divided into 20 arrondissements, each with its own mayor, three assistants, and a town hall. The chief magistrate is the Préfet de la Seine. Each arrondissement is divided into quarters, corresponding to wards in an American city. The Préfet de Police is at the head of the gendarmes, the fire brigade, and the city police, with headquarters in the Boulevard du Palais.

The first mention of Paris, under the name of Lutetia, is made by Cæsar in his *Commentaries*, 53 B.C. About 250 A.D. Christianity was introduced by St. Denis and about 360 the name Paris was applied to the town in a synodal letter convening a council there.

International exhibitions have been held in Paris in 1855, 1867, 1878, 1889, and 1900. On June 9, 1940 the French government quit Paris because of the German advance. June 14 the Germans occupied the city. Consult *La Gournerie, Histoire de Paris et de ses Monuments*; Lacroix and Verbeekhoven, *Paris Guide par les principaux Ecrivains et Artistes de la France*; Lucas' *A Wanderer in Paris*; Vizetelly's *Life in Paris* (1919); Wolff's *The Story of Paris Churches* (1918) and *Historic Paris* (1921); and the Guide Books of Joanne, Baedeker, Meyer, Murray, Grieben and Muirhead. See EUROPE, GREAT WAR OF; PARIS, TREATIES OF; CATHEDRALS; PARIS, UNIVERSITY OF.

Paris, also called Alexander, was, according to Homer, the second son of Priam and Hecuba, sovereigns of Troy. His mother dreamed during her pregnancy that she

gave birth to a firebrand, which set the whole city on fire, a dream interpreted to signify that Paris should originate a war which should end in the destruction of his native city. To prevent its realization Priam caused the infant to be exposed upon Mt. Ida, where he was taken by the shepherd Agelaus and brought up as his son. An accident having revealed his parentage, old Priam became reconciled to his son, who married Ceneone,

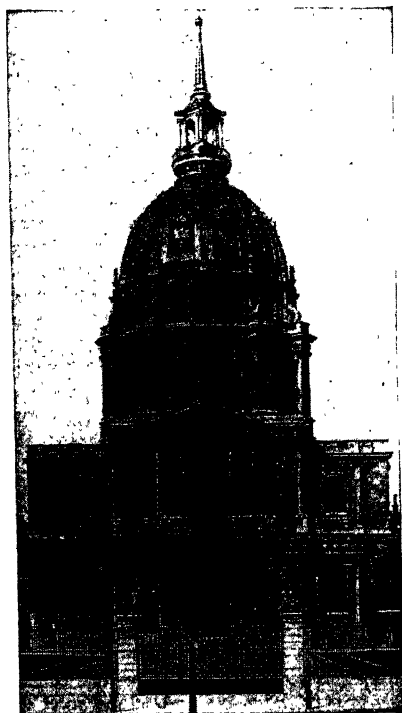


Photo by Publishers Photo Service.

Hotel des Invalides in which is the Tomb of Napoleon I.

daughter of a river-god. See HELEN; TROY.

**Paris, Declaration of.** See **Declaration of Paris.**

**Paris, Gaston** (1839-1903), French Romance philologist, was born in Avenay. In 1872, with Paul Meyer, he founded *Romania*, and for thirty years contributed masterly articles and reviews to the journal. His studies covered the whole field of romance, but his most important work lay in the department of early French, and as a popular expounder of his science he remains unequalled.

**Paris, Matthew** (c. 1200-59), English chronicler. His great work is the *Historia*

*Major*, or *Chronica Majora*. It contains the chronicle of St. Albans down to 1188, the whole being revised and completed by Paris.

**Paris, Paulin** (1800-81), French historian, father of Gaston Paris. In the department of old French, he did a vast amount of admirable pioneer work.

**Paris, Plaster of.** See **Plaster of Paris.**

**Paris, Treaties of,** the name applied to several important treaties negotiated in Paris during the 18th, 19th, and 20th centuries. The treaty of Feb. 10, 1763, which brought to an end the Seven Years' War, was concluded between Great Britain and its ally Portugal, and the Bourbon monarchies, France and Spain. The treaty signalized the downfall of French power in North America and the establishment of the maritime and colonial supremacy of Great Britain. The treaty of February 6, 1778, formally cemented the alliance between France and the American colonies. By the treaty of September 3, 1783, between Great Britain and the United States, Great Britain recognized the independence of her former colonies. The fall of Napoleon was followed by the first peace of Paris, of May 30, 1814, between France on the one hand and the allied powers of Great Britain, Austria, Russia, and Prussia on the other.

The battle of Waterloo was followed by the second peace of Paris, concluded between France and the Allies, November 20, 1815. Its effect was to restrict France to the boundaries of 1790. The treaty of March 30, 1856, between Russia on the one hand and France, Great Britain, Sardinia, and Turkey on the other, terminated the Crimean War. By the treaty of December 10, 1898, the war between Spain and the United States was brought to an end. The Peace Conference to conclude terms at the close of the Great War of Europe (1914-19) also met in Paris, though the treaty is known as the Treaty of Versailles. See **PEACE CONFERENCE OF PARIS**; **DECLARATION OF PARIS.**

**Paris, University of,** one of the oldest and most important universities in the world, owes its origin to the schools of dialectic attached to Notre Dame in the early 12th century. Abélard transferred it to the Montagne Ste. Geneviève. Before the close of the 13th century the Sorbonne, the college of theology, completely overshadowed the rest of the university. During the Middle Ages the university grew and prospered, and as early as the 16th century there were from 12,000 to 15,000 students drawn from all parts of the world. In 1896 the Sorbonne became the

seat of the University of Paris and the provincial universities became independent. It now includes faculties of arts, science, law, medicine, letters, and pharmacy. See SORBONNE.

**Parish**, originally in its Greek form (*paroikia*) the district of a bishop (equivalent to diocese). In England the parish was first an ecclesiastical area, under the charge of a single priest. When parish church-wardens were charged by statute with the relief of the poor, in 1535, the parish was recognized as a civil unit. As now used in the United States 'parish' denotes the members of a local church or the territory in which they reside. In Louisiana the subdivisions of the State, known in other States as counties, are called 'parishes.'

**Park**. See **Public Parks**; **National Parks**.

**Park, Marion Edwards** (1875- ), American educator, was born in Andover, Mass. She was graduated from Bryn Mawr College in 1898, and studied at Johns Hopkins University and the American School of Classical Studies, Athens. She was instructor at Colorado College, 1902-06, dean of Simmons College, 1918-21, and of Radcliffe College 1921-2. Since 1922 she has been president of Bryn Mawr College.

**Park College**, a coeducational institution, Parkville, Missouri, founded in 1875. Its special interest is in Christian training, and it offers opportunities for those who are without financial resources.

**Parker, Alton Brooks** (1852-1926), American judge, was born at Cortland, N. Y. He was made justice of the Supreme Court of the state in 1885, being elected for the full term of 14 years in 1886. In 1897 he was elected chief judge of the Court of Appeals on the Democratic ticket, and his election made him an eligible candidate for either governor or president. In 1904 he was nominated for the presidency by the Democratic National Convention, but was defeated by Theodore Roosevelt.

**Parker, Francis Wayland** (1837-1902), American educator, was born at Bedford, N. H. In 1896 he became principal of the Chicago Normal School, and in 1899 president of the Chicago Institute. His educational works include *Talks on Teaching* (1883), *The Practical Teacher* (1884), and *How to Study Geography* (1889).

**Parker, Sir Gilbert** (1862-1932), English author, was born in Canada. He has written many works, including *Pierre and his People*

(1892), *The Translation of a Savage* (1894), *The Seats of the Mighty* (1896), *The Battle of the Strong* (1898), *The Right of Way* (1901), *Donovan Pasha* (1902), *History of Old Quebec* (1903), *A Ladder of Swords* (1904).

**Parker, Horatio William** (1863-1919), American composer born at Auburndale, Mass. Of his compositions, the best-known, his oratorio *Hora Novissima*, composed in 1892, has been repeatedly given by the most important choral societies of the United States, and was performed at Chester and at Worcester in England, the first American composition to be heard at these festivals.

**Parker, Theodore** (1810-60), American clergyman, born at Lexington, Mass. He was a great student, especially of languages, of which he had finally more than a dozen at his control. In 1837 he was settled in the Unitarian church at West Roxbury, near Boston. He developed a fairly definite religious system, and he was active in anti-slavery propaganda. His collected works were published in 14 volumes in London (1863-70), and in 10 volumes in Boston (1870).

**Parker, Willard** (1800-84), American surgeon, was born in Lyndeborough, N. H. He was professor of surgery in the College of Physicians and Surgeons (1839-80). The Willard Parker hospital for contagious diseases is named in his honor. Willard Parker



Francis Parkman

ranked as one of the greatest surgeons of the day. Among his contributions to practical surgery were the operation of cystotomy and operative procedures for appendicitis and for laceration of the perineum during parturition.

**Parkersburg**, city, West Virginia. Oil refining is the chief industry. Manufactures include lumber, furniture, glassware, chemicals, boilers, foundry and machine-shop products, oil-well supplies, vitrolite, porcelain, shoes, mattresses, reamers, code wire, shovels, clothing, food products, and brick; p. 30, 103.

**Parkhurst, Charles Henry** (1842-1933), American clergyman, was born in Framingham, Mass. In 1880 he was called to the pastorate of the Madison Square Presbyterian Church in New York City. He became known for his outspoken denunciation of dishonesty in civic matters, and his activity in the campaign against crime led to an investigation of the New York police by the State legislature. In 1891 he succeeded Dr. Howard Crosby as president of the New York Society for the Prevention of Crime. Dr. Parkhurst's published works include: *My Forty Years in New York* (1923).

**Parkinson, James** (1755-1824), English physician, notable also as a palæontologist and a political reformer. He wrote the first report in English on appendicitis (1812), a report on *Madhouses* (1811), and a classic description (1817), of shaking palsy or Parkinson's disease.

**Parkinson's Disease**, another name for Paralysis Agitans (see PARALYSIS).

**Parkman, Francis** (1823-93), American historian, was born in Boston, Sept. 16, 1823. His mind early turned to literature and history, and while yet an undergraduate he formed the purpose of writing the history of the French power in America. He employed his vacations in studying on the ground the history of the French occupation and the struggles between the French and the English: In 1845, with the story of Pontiac's conspiracy particularly in mind, he visited the West and Northwest, going as far as St. Louis. The next year he explored the historical sites of Western Pennsylvania and visited Washington, and undertook his longest and most arduous journey, following the overland route from Western Missouri to Oregon. His works include *The Oregon Trail* (1849); *The Conspiracy of Pontiac* (1851); *The Pioneers of France in the New World* (1865); *Jesuits in North America* (1867); *La Salle and the Discovery of the Great West* (1869); *The Old Regime* (1874); *Count Frontenac and New France under Louis XIV* (1877); *Montcalm and Wolfe* (1884); and *A Half-Century of Conflict*, his last work (1892). Parkman's scholarship rested

upon a thorough first-hand acquaintance with the sources, printed and manuscript, and a detailed personal knowledge of the topography of the regions whose history he described; and it is these qualities, joined to imagination, sympathy, a true sense of proportion, and a fascinating style, that won for him in his lifetime cordial recognition as the foremost American historian.

**Park Range**, a range of mountains in Colorado. The summits reach altitudes of more than 14,000 ft., the highest being Mt. Lincoln, on the border of South Park (14,297 ft.).

**Parks**. See **Public Parks**; **National Parks**; **Playgrounds**.

**Parlement**, a term used in the early Middle Ages, in France, for any deliberative assembly. By far the most important was the Parlement of Paris. Consult Mérihou's *Les Parlements de France*.

**Parley, Peter**. See **Goodrich, Samuel**.

**Parliament**, the supreme legislature of the United Kingdom of Great Britain and Northern Ireland, consisting of the Sovereign and the Three Estates of the Realm—the Lords Spiritual, the Lords Temporal, and the Commons. The self-governing institutions of the Anglo-Saxons may be regarded as the germ of the Parliament. Under the comprehensive rule of Egbert, the several Witenagemôts became one single great council, representative of the whole realm over which he held sway. The presence of a powerful ecclesiastical element in this council balanced the influence of the great thanes, and contributed in no small measure to the preservation of popular liberties. The Witenagemôt was swept completely away by the Norman conquest. The new king (William) inaugurated what was in effect an absolute monarchy. Under the feeble rule of William's immediate successors, the barons regained much of the power of which that able and forceful sovereign had deprived them. The point of importance, however, is that, as the two parties in the course of years showed themselves evenly matched, they were compelled in turn to seek the assistance of the people, whose favor, at one time despised, gradually became a weighty factor in the struggle. In a country like England, where a reverence for ancient forms and a tenacious attachment to precedent seem from the very first to have formed an integral part of the national character, it was of vital consequence that the local assemblies and courts became woven into the texture of the feudal system; and in and through them were kept alive a spirit of in-

dependence, and the instinct or reverence for representative institutions.

Of great effect upon the development of a free constitution was the action taken by Henry II. in the matter of feudal services. With a statesmanship not less perspicacious than that of William the Conqueror, he set himself resolutely to curb the power of the great barons. His vigorous policy of reform in the administration of justice greatly benefited the whole people by giving them fresh security for life and property. The most important of his innovations was his substitution of scutage, or money payment, for the old feudal services in war. From this moment, though probably neither party had the wisdom to see it, the interests of the barons and the ordinary freemen of England became practically identical. King John succeeded in alienating in turn the barons, the church, and the people. The result was that they combined, and in 1215 extorted from him the *Magna Charta*, that momentous document which is the foundation of the liberties of all the Anglo-Saxon communities throughout the world. Simon de Montfort, Earl of Leicester, the leader of the barons, having defeated the king at the battle of Lewes in 1264, called together the first Parliament of England at Westminster on January 28, 1265, which in form contained all the essential elements of the Parliament of to-day.

In 1295 Edward I. called together at Westminster the three estates of the realm, representative of every important class and interest in the country. Henceforth the commons became a recognized integral part of the legislative body. The clergy looked askance upon the new body, and declined in most cases to attend in response to the king's summons. The result was that as a separate estate they lost all direct control over the course of legislation and taxation; and at the present day a small and, as far as voting power is concerned, an insignificant body of bishops, still sitting in the House of Lords, is all that remains to represent the former first estate of the realm. It was in the early years of Edward III.'s reign that Parliament definitely divided into two chambers—the House of Lords, the natural successor of the ancient great council of barons; and the House of Commons, consisting of the knights of the shire and the representatives of the burgesses. In the course of the subsequent development of Parliament, the authority of the Commons, slight as it was in the early

years, has gradually but steadily increased.

It is a well-known maxim that the sovereign at the present day reigns, but does not rule—that is to say, the king could not and would not oppose his will to the definite and strongly-declared wishes of his people expressed through Parliament. But there can be no doubt that within the limits imposed upon him by constitutional practice—which in England has always been stronger than positive constitutional law—the sovereign can exercise, and does exercise, a very decided and important influence upon the policy of the country. **HOUSE OF LORDS.**—The House of Lords, the second branch of legislature, consists of lords spiritual and lords temporal. The latter comprise hereditary peers and life peers or law lords (lords of appeal in the ordinary). Twenty-six seats are assigned to the former. The archbishops of Canterbury and York and the bishops of London, Durham, and Winchester always sit. The sovereign has a constitutional right to be present in the House of Lords at any time during its deliberations. The Prince of Wales and other princes of the blood royal have seats in the House of Lords but they possess no rights or privileges in the house itself which are not enjoyed by other peers. The House of Lords is also the theatre of all that is ceremonious in the life and work of Parliament. If the king opens or prorogues a new Parliament or a new session in person, it is there that the pomp and pageantry attendant upon such an occasion are witnessed. If the Parliament or the session is opened or prorogued by royal commission, it is in the House of Lords that the ceremony takes place. The royal assent to measures passed through both Houses of Parliament is declared in the House of Lords. The House of Lords, apart from its legislative functions, possesses jurisdiction as the final court of appeal for the United Kingdom, in which the House of Commons exercises no part.

**HOUSE OF COMMONS.**—Although it represents the growth and development of six centuries, it is only within the memory of many still living that this house assumed the character which is in any real sense representative of the people, and it is less than a generation since it became the democratic assembly it is at the present time. A century ago, Birmingham and Manchester, in spite of their great populations, and in spite, too, of keen political intelligence and far-

reaching commercial activity, were not yet judged worthy of the least voice in affairs.' At that very time Old Sarum, consisting of a mound and a few ruins, returned two members. At Gatton, the right of election lay in the hands of Lord Monson alone. A like number of 'representatives' sat for a park in which there was not the least vestige of a dwelling. No less than 307 members of the House of Commons were returned by the private patronage of 154 persons. The Reform Act of 1832 admitted the middle classes to power, and under its provisions the House of Commons began to represent more widely the true interests and political

the crown to the House of Commons. Ministers ceased in all but name to be the servants of the sovereign. The source of their strength was no longer the favor of the crown, but the confidence of the House of Commons. Moreover, the Lower House enjoys the undisputed prerogative of taxation. Among the changes in the conditions under which the House of Commons carries on its functions one of the most remarkable is the publicity which attends all its proceedings. The reporters' gallery, which dates no further back than 1835, has now taken its place permanently. But even today the reporters are 'strangers' in the house, and



*Royal coach bearing George V to an opening of Parliament.*

sentiments of the nation. The principle of popular representation was enlarged by the Reform Act of 1867, by which the balance of power was transferred to the small-shopkeeper class, who were now, for the first time, endowed with the franchise. A further extension of the principle took place in consequence of the Act of 1884-5, the effect of which was to enfranchise the working-classes, and to transform the House of Commons into a strong, powerful, and purely democratic assembly. Nor is the process of evolution even yet at an end. The migration of the population toward the large industrial centers during the last years of the 19th century led to anomalies which are recognized as indefensible. The House of Commons is not only the popular branch of the legislature, it is also the real governing body of the country.

The effect of Walpole's policy, in Queen Anne's reign, when it was finally carried through, was to make the cabinet the seat and center of the executive government, and to transfer the power and authority of

it is still 'a breach of privilege for any person whatever to print, or publish in print, anything relating to the proceedings in either house.' The house, however, has shown an increasing indisposition to enter into contests with the press upon matters which might be regarded as infringing on its privileges. Under the Parliament Act of 1918 women were made eligible to Parliament and in December 1919 the first woman member took her seat, and under the Representation of the People Act (1918) seats in the House of Commons were redistributed on the basis of one to every 70,000 population and redistribution in Ireland was made on the basis of 43,000. The total number of members who sit in the house is 615,—492 representing English constituencies, 74 Scottish, 36 Welsh, and 13 Northern Irish. Consult Smith's *History of the English Parliament*, Dickinson's *The Development of Parliament During the Nineteenth Century*; MacDonagh's *The Pageant of Parliament* (1921).

**Parliamentary Agent**, one who pilots a



private bill or petition through the necessary stages in Parliament. In the United States, the professional 'lobbyists' correspond to them.

**Parliamentary Law**, rules, precedents, and usages which are generally accepted as the most convenient and practicable for the government of proceedings in deliberate assemblies or organizations. The rules and usages of Congress have great weight as correct parliamentary law in the United States generally, but the legislature of each State has a code of its own containing the general rules, and special ones not commonly accepted. Inasmuch as the rules of parliamentary law are not contained in the decisions of the courts nor prescribed by statute, they are not binding on any body having occasion to apply them. However, for convenience, it is customary for all organizations and deliberative assemblies to follow the rules most generally accepted. Consult Reed's *Rules of Order*; Robert's *Rules of Order*; Cushing and Lowe's *Manual of Parliamentary Practice* (1925).

**Parloa, Maria** (1843-1903), American domestic scientist, was born in Massachusetts, and after 1882 maintained a cooking-school in New York City for many years. She subsequently made her home in Bethel, Conn. She published several books on domestic economy, including *Miss Parloa's Cook Book and Marketing Guide* (1882) and *Miss Parloa's Young Housekeeper* (1893).

**Parma**, town, Italy, capital of the province of Parma; 55 m. n.w. of Bologna. Features of interest are the cathedral dating from 1059, and the university founded in 1599. The leading industries are the manufacture of musical instruments, silks, hats, leather and glass. It is notable as the home of Coreggio; p. 62,603.

**Parma, Duchy of**, a duchy of Northern Italy, formed (1545) with Piacenza and the surrounding district, by Pope Paul III. for his natural son, Pier Luigi Farnese. It remained the property of this family until its extinction in 1731. In 1860 Parma was united to the kingdom of Italy.

**Parmenides**, ancient Greek philosopher, was a follower of Xenophanes, and founder of the Eleatic school, he being a native of Elea in S. Italy. He flourished during the first half of the 5th century B.C. His chief doctrine was the belief in an eternal, unchanging being—namely, God.

**Parmigiano, Francesco Mazzuoli** (1504-40). Italian painter, was a native of Parma. His works, which are scarce, include *Baptism of Christ*, *St. Margaret*, *Cupid Fashioning his Bow*, and *Vision of St. Jerome*, and are distinguished by elegance of form, grace of countenance, and charm of color, while his etchings are models of delicacy and freedom.

**Parnassia**, a genus of hardy herbaceous plants (Saxifragaceæ). They are mostly bog-plants, and bear large star-like white or yellow flowers.

**Parnassus**, a mountain (8,070 ft.) in Phocis, ancient Greece, a few miles n. of Delphi. It was reputed to be a favorite resort of Apollo and the Muses, and was sacred to Dionysus. Its modern name is Lyakoura.

**Parnell, Charles Stewart** (1846-91), Irish political leader, born at Avondale, Wicklow. His mother was a daughter of Rear-Admiral Charles Stewart of the U. S. navy. In 1879 he was elected president of the Land League. Then, accompanied by Mr. Dillon, he came to the United States, and in aid of his movement raised a large sum of money by popular subscription. In the autumn of 1880 he took an active part in organizing the Land League. After the Land Act passed into law, Parnell was present at several large Land League demonstrations, and in October, 1881, he was arrested and conveyed to Kilmainham Jail. Parnell remained in Kilmainham Jail till April 10, 1882. In the session of 1882 he took an active part in procuring the passing of the Arrears Act and of the Tramways and Laborers' Acts in the session of 1883. A national subscription to Parnell was started in the spring of 1883, and a sum of about £37,000 was raised among the Irish at home and in the U. S., and presented to him. The *Times* published certain allegations and letters in facsimile, charging Parnell and others with conspiracy, and with founding an organization that had for its object the separation of Ireland from England. The letters were proved to be the forged work of Richard Pigott, an Irish journalist. Parnell on the main points completely vindicated himself. After his vindication he brought an action against the *Times*, and obtained £5,000 damages. In 1890 he was charged with committing adultery. The adverse verdict of the divorce court caused a revulsion of feeling throughout the country and a split in the Irish party. Parnell died somewhat suddenly at

Brighton. See T. P. O'Connor's *Life of Parnell*, Mahoney's *Life of Parnell* (1886), and A Patriot's *Mistake* (1906).

**Parnell, Thomas** (1679-1718), English poet, was born at Dublin. His *Poems*, mostly translations and adaptations in fluent and elegant verse, were published by Pope in 1721. They reach the high-water mark of the classical manner, and had a great influence on Goldsmith, Young, Gay and Collins.

**Parody** is a form of literary composition based imitatively upon another work, its purpose being to turn that work to ridicule and to make fun of its author. But true parody is something more penetrating than is generally supposed. The best parodist gets into his victim's brain, and humorously applies his methods to alien subjects. Really good parody is very rare. Any piece of comic verse bearing a superficial resemblance to another poem is described by that name; whereas it is often only a burlesque. Thus, Shelley's *Peter Bell the Third* is a perversion of Wordsworth's *Peter Bell*. For true parodies of Wordsworth one must go to Catherine Fanshawe, to the *Rejected Addresses*, and to Mr. Lang's *Ban and Arrière Ban*, wherein is a series of comic poems written under the influence of Wordsworth in a spirit of excellent parody. Parodies are, as a rule, based upon serious work. A. C. Hilton's *Vulture and the Husbandman* is a new comic poem based upon Lewis Carroll's *Walrus and the Carpenter*, rather than a parody. Lewis Carroll, however, being a serious maker of comic books with distinct peculiarities of method, could be both imitated and parodied. His own verses entitled *Father William* are less a parody than a burlesque of Southey's ballad. The finest sustained effort in parody is *The Rejected Addresses* (1812), by James and Horace Smith, in which the chief characteristics and defects of Wordsworth, Scott, Southey, Byron, Moore, Crabbe, and other poets are dexterously emphasized. Parodists in verse since the Smiths include the authors of the *Bon Gaultier Ballads* (1855), Sir Theodore Martin and Aytoun; Calverly, in *Verses and Translations* (1862) and *Fly Leaves* (1872); Mr. Owen Seaman, notably in *The Battle of the Bays* (1896) and *Borrowed Plumes* (1902); and Mr. A. T. Quiller-Couch ('Q') in *Green Bays* (1893). The best prose parodist of recent times is Bret Harte, whose *Condensed Novels* (1867) are still unap-

proached, although Mr. Max Beerbohm and others have done very dexterous things in this medium. See Walter Hamilton (6 vols. 1884-9) for a collection of English and American parodies.

**Parole**. A word used as a check on the countersign in order to obtain more accurate identification of persons. The parole as used in the U. S. army is usually the name of a general or other distinguished person, while the countersign is the name of a battle. Parole also means the verbal promise of a captured officer who binds himself on honor not to go beyond certain prescribed limits if released, nor to take service again during the present war, unless duly exchanged under certain specified conditions.

**Paros**, an island in Ægean Sea, belonging to the Cyclades, 36 m. in circumference. It is famous for its marble quarried from Mount Marpessa (now Hagios Ilias); p. 9,000.

**Parotid Glands**, the largest of the three pairs of salivary glands. The parotid gland reaches from the cheek bone above to the angle of the jaw below, and also curves backward under the ear.

**Parquetry**, a kind of flooring composed of blocks of wood laid level with one another, and arranged in geometric or other patterns.

**Parr, Catherine** (1512-48), 6th wife of Henry VIII. of England and daughter of Sir Thomas Parr of Westmoreland. On the king's death she married Sir Thomas Seymour (1547).

**Parrakeet**, the name given to parrots of genera *Palæornis* and *Platycercus*. The former genus contains about two dozen species. The best known species is the brilliantly colored Rosella parrakeet, which is often kept in captivity.

**Parramatta**, town, New South Wales, Australia. The district is mainly devoted to fruit-growing, especially oranges. There are also a tweed factory and kerosene and shale works; p. 16,400.

**Parrhasius**, ancient Greek painter, was a native of Ephesus, but resided at Athens. His pictures excelled in proportion and accuracy of detail and his painting of *Demos* (Democracy) is famous.

**Parricide**, one who murders his father. Under Roman law, one who murdered his parents was scourged and then sewed up in a leathern sack with a live dog, a cock, a viper, and an ape, and cast into the sea. Under United States and English law, the

parricide is treated as an ordinary murderer.

**Parrish, Anne**, Mrs. Charles A. Corliss (1888- ), author, was born in Colorado Springs, Colo. Her best-known books are *The Perennial Bachelor* (1925) winner of the Harper prize; *All Kneeling* (1928); *Floating Island* (1930); *Loads of Love* (1932). Mrs. Corliss makes her home in New York City.

**Parrish, Maxfield** (1870- ), American painter and illustrator. He ranks high as an illustrator, being particularly successful in the art of making magazine covers attractive by designs in which imagination, drawing, and color are all of high quality. Among the books to which he has contributed illustrations are *The Golden Age*, *Mother Goose in Prose*, and *Knickerbocker's History of New York*.

**Parrish, Stephen** (1846-1938), American artist and etcher, was born in Philadelphia. He was past thirty years of age when he began to paint and etch, but after a year's art study his work was accepted at the Pennsylvania Academy in Philadelphia and at the National Academy in New York. He was at his best in winter scenes of a misty, dreamy character. His etchings include sketches of many New England seaboard towns.

**Parrot**, a name which may be applied to all the members of the sub-order Psittaci, many of which, such as the macaws, cockatoos, love-birds, lorries, and so forth, have also other English names. The bill is of the 'nut-cracker' type—that is, it is short and stout—both upper and lower jaws being strongly arched, the lower truncated, while the upper, owing to its mode of articulation with the skull, is freely movable, and projects like a hook over the lower. There are four toes, and of these the first and fourth are permanently directed backward, and the other two forward, thus forming a very efficient instrument in climbing and in 'handling' food. There are about 500 species of parrots, which are generally, though not uniformly, distributed throughout the warmer parts of the world. In coloration parrots are often gaudy, green being the predominant hue, though other brilliant tints also occur. Most species are more or less social in their habits, but, unlike some other social birds, they are monogamous. The natural cry is a harsh scream, but in captivity the birds display remarkable powers of mimicry,

many being able to talk and whistle. The young are very helpless at hatching and are fed with half-digested food from the crops of the parents. The gray parrot from equatorial Africa in captivity has been known to live more than 60 years. Among the diseases to which parrots are subject is psittacosis or parrot fever, an acute infection which is transmissible to man.

**Parrot Fever.** See **Parrot**.

**Parrot Fish**, or **Parrot-wrasse**, a general name applied to members of the wrasse family, because of the fact that the teeth are soldered together, so that the jaws form a sharp beak, and also because of a resemblance to parrots in the brilliance of their colorings.

**Parrott, Robert Parker** (1804-77), American soldier and inventor, was born in Lee, N. H. He is chiefly famous for having invented the Parrot rifled cannon and projectiles, which were extensively used by both the army and navy during the Civil War.

**Parry Sound**, town, Ontario, Canada. It has the best harbor on Georgian Bay, and is an important distributing point for Northern and Eastern Ontario. The principal industries are lumbering and feldspar mining; p. 3,546.

**Parsees**, or **Parsis**, the members of a religious community, now found chiefly in Bombay, India. They comprise about 100,000 people, and though insignificant in point of numbers, occupy a position of great influence among the Indian people. The Parsees are followers of Zoroaster. They regard fire as a divine symbol of purity and good, and expose the dead in lofty buildings called 'towers of silence.'

**Parsley** (*Carum petroselinum*), a pot herb belonging to the order Umbelliferae. It has much divided and crimped foliage, and is used for garnishing and flavoring.

**Parsnip** (*Pastinaca sativa*), a common vegetable belonging to the order Umbelliferae, cultivated for its edible root, which has a peculiar sweetish taste.

**Parson**, a name commonly used of any clergyman, but strictly applicable only to one in full possession of all the rights of a parish church.

**Parson Bird** or **Tui**, a remarkable little bird of New Zealand. It owes its name to two white tufts of curling feathers on the throat, and the white bands across the

shoulders, which reminded the first colonists of a clergyman's pulpit dress; the remainder of the plumage is glossy black.

**Parsons, Albert Ross** (1847-1933), American musician and archæologist, was born in Sandusky, O. Several of his songs, as *Night has a Thousand Eyes* and *Three Fishers*, have attained wide popularity. From 1893 to 1914 Parsons was president of the American College of Musicians of the University of the State of New York.



*Parsnip*

1. Taproot (parsnip). 2. Flower. 3. Fruit.  
4. Carpel, section.

**Parsons, Charles** (1821-1910), American painter, was born in Manchester, England. He was noted especially for landscape views of New York City and harbor.

**Parsons, Sir Charles Algernon** (1854-1931), British engineer and inventor. He is famous as the inventor of the compound steam turbine bearing his name, first produced in 1884, used in the torpedo boat *Turbinia* in 1897, and subsequently adopted for warships, merchant vessels, and electric generating plants.

**Parsons, Herbert** (1869-1925), American political leader, was born in New York City. In 1905-06 he was chairman of the New York County Republican Committee, and in this position was largely responsible for the nomination (1906) of Charles E. Hughes, the successful candidate for governor.

**Parsons, or Persons, Robert** (1546-1610), English Jesuit, was born in Nether Stowey, Somersetshire. He was in Spain in

1588 and encouraged Philip of Spain to send forth the Armada. He was rector of the English college at Rome in 1588 and from 1597 to 1610.

**Parsons, Samuel Holden** (1737-89), American soldier, was born in Lyme, Conn. He was largely instrumental in evolving the plan which resulted in the capture of Ticonderoga. In 1788 he was a member of the convention which ratified the Federal Constitution, in 1789 was appointed first judge of the Northwest Territory, and settled at Marietta, O.

**Parsons, Theophilus** (1750-1813), American jurist, was born in Byfield, Mass. In 1806 he became chief justice of the State, an office which he held until his death. In 1836 some of his opinions were published under title of *Commentaries on the Laws of the United States*.

**Parsons, Theophilus** (1797-1882), American jurist, was born in Newburyport, Mass. He founded and edited the *United States Literary Gazette*, and wrote a number of legal and other works. These include: *Outlines of Religion and Philosophy of Swedenborg* (1875); *Elements of Mercantile Law* (1856).

**Parsons, Thomas William** (1819-92), American poet, was born in Boston. In 1843 he translated the first 10 cantos of Dante's *Inferno*. An edition of his *Poems* appeared in 1893. Parsons is the Poet in Longfellow's *Tales of a Wayside Inn*.

**Parsons, William Barclay** (1859-1932), American civil engineer, was born in New York City. He was appointed chief engineer of the Rapid Transit Commission in 1894; member of the Isthmian Canal Commission in 1904; and chief engineer of the Cape Cod Canal Construction Company in 1909. He published: *An American Engineer in China* (1900); *The American Engineers in France* (1920).

**Parsons' Case.** A case tried in Hanover co., Va., Dec., 1759. For a long time tobacco was the legal currency in Virginia, the salaries of the ministers of the established church were computed in that commodity, and the actual amount of the salary varied with the price. The clergy, being losers thereby, protested; the King disallowed the act. In 1759, a suit was brought by the Rev. James Maury against his vestry for salary legally due to him for 1758. Patrick Henry was engaged by the defendants as counsel. The court decided the act to be

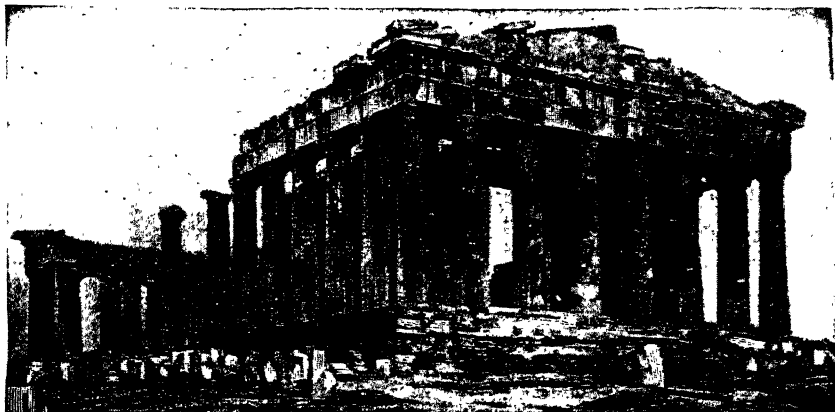
void, as it had been disallowed by the crown, but Henry's speech so influenced the jury that only one penny damages was awarded.

**Parsonstown**, or **Birr** (the latter the present name), tn., King's co., Ireland, 12 m. w. by n. of Roscrea. At Birr Castle is the famous telescope, 58 ft. long, constructed by the third Earl of Rosse (d. 1867); p. 4438.

**Parthenogenesis**, or **Asexual Reproduction**, may be defined as a mode of growth in which the bud becomes distinct from parent, though not necessarily separated from it. It occurs in simple animals only, but under many forms. A very simple form occurs in the fresh-water Hydra, which buds as a plant might bud, and liberates

s.e. of the Caspian Sea, with Media on the w. The Parthians were subject to the Persian empire, and after Alexander's conquests, to him and to the Seleucid dynasty which succeeded him. But about 250 B.C. they revolted under Arsaces, who made Parthia an independent monarchy. After the middle of the 1st century B.C. Parthia was the chief rival of Rome, and many wars were waged between the two powers. The tactics which have become proverbial as Parthian were to feign retreat, and shoot arrows backwards at the pursuers. In 226 A.D. their empire was overthrown by the Persians.

**Parties in Law** are those who are brought before the court in a lawsuit either as plaintiffs or defendants. These parties are prop-



*The Parthenon, as it is at present.*

these buds whenever a check to nutrition occurs. True parthenogenesis, the development of the egg without previous fertilization—that is, without the intervention of a male, occurs not infrequently in invertebrates, notably in insects.

**Parthenon**, the temple of Athena Parthenos on the Acropolis at Athens, was built under Pericles, being dedicated in 438 B.C. Its architects were Ictinus and Callicrates, but all the work was superintended by the sculptor Phidias. It is 227 ft. in length, 101 in breadth, and 65 in height, and was built entirely of marble from Mount Pentelicus. In the temple proper stood the great ivory and gold statue of Athena by Phidias. During the Venetian siege of Athens in 1687 an explosion threw down most of the side walls and many columns.

**Parthia**, a country of ancient Asia, lying

erly all who took part in any act or agreement which is the subject matter of the suit, and were, of course, parties to the agreement or act before litigation was begun.

**Partition**. In law, a division or apportionment of real or personal property, or the proceeds thereof, between persons owning it jointly or as tenants in common. Partition may be by mutual agreement, or by order of a court.

**Partnership**. The relation which subsists between persons carrying on any lawful business in common with a view to profit; also the group of two or more persons associated for such a purpose. A partnership is always the result of an agreement, which must, if it is to continue for more than a year, be in writing and subscribed by the parties thereto. Being a matter of contract, only persons of full legal capacity are cap-

able of entering into it. A partnership is generally known as a firm and conducts its business under a 'firm name,' adopted for the purpose. But while, for some purposes, the partnership is dealt with collectively as a separate and distinct entity, the members composing it do not lose their identity in it as is the case in a corporation, but retain their individual liability for debts, and must sue and be sued in their proper names. Every partner is an agent of the firm and of his associates for the purposes of business; and any act done by him for carrying on the business in the usual way will bind the firm unless he has no authority, and the person dealing with him knows this, or does not know him to be a partner. In the absence of any agreement to the contrary, all partners share equally in the capital and profits of the business, and must contribute equally toward the losses. A partnership is dissolved by the expiration of the agreed term, or if there is no agreed term, then by the withdrawal of any partner. Apart from agreement, the death or bankruptcy of a partner puts an end to the partnership.

**Parton, Arthur** (1842-1914), American painter, born at Hudson, N. Y. Among his landscapes and river scenes are *On the Road to Mt. Marcy* (1873) and *Winter on the Hudson* (1885).

**Parton, James** (1822-91), American author, was born in Canterbury, England. He became one of the most popular biographers of the day. His works include lives of Horace Greeley (1855), Aaron Burr (1857), Franklin (1864), and Jefferson (1874).

**Partridge** (*Perdix*), a genus of Old World game-birds, distinguished by the short and strong bill, which has the upper mandible convex and bent down toward the tip, and by the short, rounded wings and tail. The term 'partridge' has been borrowed in N. America for various grouse and quails. The common or gray partridge (*P. cinerea*) occurs throughout Great Britain and the whole of Central Europe. In the south it tends to be replaced by the French partridge (*Caccabis rufa*).

**Partridge, Alden** (1785-1854), American soldier and educator, born in Norwich, Vt. He founded military schools at Norwich, Vt., in 1820; at Middletown, Conn., in 1825; at Portsmouth, Va., in 1840; at Pembroke, N. H., in 1847; at Harrisburg, Pa., in 1850; at Brandywine Springs, Del., in 1853; and

also founded Norwich University in 1834.

**Partridge, John** (1644-1715), English astrologer, born at East Sheen in Surrey. He issued a regular almanac entitled *Merlinus Liberatus* (1680), and by this and other astrological pamphlets became famous in his profession until ridiculed by Swift.

**Partridge, William Ordway** (1861-1930), American sculptor, was born in Paris, France. In 1889 he won the competition for a statue of *Shakespeare* to be placed in Lincoln Park, Chicago, and the following year he was commissioned to prepare a statue of *Alexander Hamilton* for the Hamilton Club of Brooklyn, N. Y. The order for an equestrian statue of *General Grant* from the Union League Club of Brooklyn was received in 1894. He modelled a notable series of portrait busts of poets, including those of Shelley, Tennyson, and Whittier, of which the last is in the Boston Public Library. As an author he published *The Angel of Clay*, novel (1900), and *Nathan Hale, the Ideal Portrait* (1902).

**Partridge Berry**, name sometimes given to the red, edible fruit of *Gaultheria procumbens* and *Mitchella repens*, belonging to the order Ericaceæ. Both are low or trailing hardy plants, holding their small berries over winter.

**Partridge Wood**, the wood of *Andira inermis*, the West Indian cabbage tree, and other tropical trees.

**Parts of Speech.** In grammar, in the departments of morphology and syntax, words are treated of in certain groups which since the days of the Greek grammarians have been known as the parts of speech. According to the usual view, there were eight parts of speech—noun, verb, participle, article, pronoun, preposition, adverb and conjunction. This list differs from the modern classifications even more than the names indicate. The noun includes not only substantives and adjectives, but all the numerals and certain pronouns. The Romans maintained the tradition of eight parts of speech; but as there was no definite article in Latin, they had room for a new group, the interjections, which they separated from the adverbs. The division of the noun into substantive and adjective in the Middle Ages gave the classification its present form—noun (substantive), adjective, pronoun, verb, adverb, preposition, conjunction, and interjection. The number eight is still preserved by the omission of the participle from the list.

**Party Government**, that form of government which exists in the United States, Great Britain, and the self-governing British colonies. It is, generally speaking, a two-party system; and either party, being granted the support, real or supposed, of the electors, is prepared to assume the responsibility of administration. It does not preclude, however, the existence of minor groups. No such organization as the party was contemplated by the founders of the United States Constitution, but the principle of division of powers rendered some such device necessary for securing harmony between the executive and legislative branches. Through the party the general principles upon which President and Congress must act are practically determined in advance of election. In practice the elective officers of government are primarily party representatives, and the fact of election is the popular sanction of party principles. In view of the importance of the issues involved it was inevitable that an elaborate party machinery should be developed. The basis of the American party system is the primary, sometimes called the caucus, which registers the choice of the mass of electors upon local officers and upon delegates to the lower convention—in most States, that of the county. The county convention chooses local candidates, and delegates to the State convention; and this in turn nominates State officers and selects delegates to the National Convention. Each convention—county, State, National—elects a committee which shall have charge of the party machinery in the interval between conventions. As party lines are drawn mainly with regard to national issues, the position of the national committee is of predominant importance. The members of party committees serve without pay, but it is generally understood that their services will in the end be rewarded through political preferment. While the party system as it exists in America may be said to contribute to governmental efficiency, it has given rise to many serious abuses. Chief among these is the political corruption which appears to be its inevitable concomitant. The party organization degenerates often into a 'machine' ruled by men whose qualification is their power to bring out a large vote. See DEMOCRATIC PARTY and REPUBLICAN PARTY, as well as articles on other political parties.

**Party Wall**, a wall between the property of adjacent owners, which each is entitled to use to support a building on his own land. Either can increase the height of the wall to a safe limit, and under-pin the wall with a deeper foundation if necessary, but he is liable for any damage which may result thereby to the other party. If the wall needs repairs, one party may repair it at his expense and compel the other to contribute ratably.

**Pasadena**, city, California. Its picturesque location, the charms of its sub-tropical vegetation, and its genial climate have made it the Mecca of tourists and health seekers. The important buildings include the California Institute of Technology. The city has a stadium with a seating capacity of 60,000 persons where is staged on Jan. 1, the East and West football game, immediately following the Tournament of Roses parade, an annual event established more than 30 years ago. In the vicinity are Mt. Wilson observatory and the San Gabriel Mission. Central Park and the Arroyo. The industrial life of the city is centered in the raising of oranges, lemons, and other fruits. Fruit packing and canning are carried on; p. 81,864.

**Pasargadæ**, the older of the two capitals of ancient Persia (Persepolis was the other), is said to have been founded by Cyrus the Great on the battlefield where he defeated Astyages. Its site has been identified, through existing ruins, as in the valley of the Murghab.

**Pascal, Blaise** (1623-62), French mathematician and writer, was born in Clermont-Ferrand. Before he was 16 he wrote a treatise on conic sections, dating a new departure in their treatment. After that he invented an arithmetical machine; completed Torricelli's experiments, thereby conclusively determining the weight of air; applied barometrical readings to the measurement of heights; applied the principle of the equilibrium of fluids to the construction of the hydrostatic press; laid the foundation of the theory of probability; and invented the arithmetical triangle. Later on (1658) he discovered the properties of the cycloid, which hastened on the advent of the differential calculus. Pascal wrote the *Lettres provinciales* (1656-7), in which the opposite arguments of Jesuits and Jansenists are dramatically pitted against each other. In

1670 was published Pascal's *Pensées*, purporting to be notes of an apology for Christianity left by Pascal.

**Pas-de-Calais**, department in the n. of France, comprising part of the old provinces of Artois and Picardy. Fishing is an important industry, particularly in the neighborhood of Boulogne, and near Bethune are large coal mines. Arras is the capital, Boulogne and Calais the chief ports; p. 1,171,912.

**Pasha**, a title derived from the Persian, applied to the highest officials—military, naval, and civil—of the Turkish empire. Among civil officials the governor of a province is *ex officio* a pasha.

**Pasque Flower**, the popular name of the beautiful mauve-flowered *Anemone pulsatilla*, a valued spring-flowering plant. The silky *A. patens* is the American pasque flower.

**Passaic**, city, New Jersey. Features of public interest include the house used by Washington as headquarters during his retreat to Morristown. The leading manufactures are rubber goods, worsteds, cotton goods; p. 61,394.

**Passaic River**, a river of northern New Jersey, rising near Morristown. It flows n.e. and n., forming the boundary between Union and Essex cos., and then turning e. and s. flows into Newark Bay. At Paterson it has a descent of 70 ft., most of which is made in one fall.

**Passamaquoddies**, a nearly extinct Algonquin tribe of North American Indians, formerly belonging to the Abnaki confederacy. They occupied the seaboard about the New Brunswick and Maine frontiers, where the name still survives in Passamaquoddy Bay and River. By 1866 they were settled chiefly at Sebaik and Lewis on the shores of Passamaquoddy Bay, and now number between three and four hundred.

**Passarowitz**, or **Posarevac**, town, Yugoslavia. Here, on July 21, 1718, peace was concluded between the Sultan Ahmed III. and the Emperor Charles VI., whereby Turkey ceded to Austria part of Serbia, including Belgrade, Bulgaria, and Little Walachia, and a truce of 25 years was established. In October, 1915, Passarowitz was captured by the Austro-German forces; p. 15,000.

**Passau**, a town and episcopal see, Bavaria, Germany. Among the noteworthy features of the town are the Cathedral, founded as

early as the 5th century, twice rebuilt in the 12th century, and remodelled in the 17th century; the Rathaus, enlarged and restored in 1888-93. Leather goods, machinery, matches, paper and porcelain are manufactured. Passau was the *Castra Batavia* of the Romans. A treaty, securing religious freedom to the Protestants, was signed here in 1552; p. 25,000.

**Passavant, William Alfred** (1821-94), American clergyman, philanthropist, and editor, was born at Zelienople, Pa. He devoted himself to the founding of hospitals and educational and religious institutions throughout the country, being a principal organizer of Thiel College, Greenville, Pa., in 1870, and of the Chicago Lutheran Theological Seminary in 1879. He founded and edited the *Missionary* and the *Workman*.

**Pass Christian**, city, Mississippi. It is one of the largest and most fashionable watering places on the Gulf. A shell-paved avenue extending seven miles along the shore is a notable feature. The canning of oysters and shrimps, and the raising of garden truck are important industries; p. 3,338.

**Passeriformes, Passerine** or **Perching Birds**, an order of birds which includes more than half the known forms. Among the peculiarities are the following: the feet always bear four toes, the first being directed backward and moved by a muscle of its own; the young are naked, or almost so, when hatched, and are helpless; the tail has usually 12 quill feathers, and there are from nine to ten primary quills in the wing. The passerine birds are regarded as the highest of the birds, and it is only within the order that we find the power of song in the strict sense developed.

**Passion Flower**, or **Passiflora**, a genus of mostly climbing shrubs and herbaceous plants belonging to the order of Passifloraceæ. With a few exceptions they are natives of tropical America and most of them bear showy flowers, usually of remarkable form and with a crown of fringe-like filaments inside the corolla. *P. caerulea*, with beautiful blue or rose colored flowers, is the commonest of the passion flowers in American greenhouses.

**Passionists**, a Roman Catholic order of mission priests, formally known as 'Barefooted Clerks of the Holy Cross and Passion of Our Lord,' whose special work is to preach the Passion of Jesus Christ in His



redemption of the world. The founder of the order was St. Paul of the Cross (d. 1775).

**Passion Music.** In nearly all Christian countries the chapters in the gospels which narrate the passion of our Saviour have from an early period been recited or sung as part of the church service during Holy Week. Passion music was developed into a form of oratorio; one of the grandest works of this nature being the *Passion According to St. Matthew* (1729) of J. S. Bach.

**Passion Play,** a dramatic performance of the type of the mystery or miracle play, and having as subject the passion of Jesus Christ. Passion plays flourished toward the end of the Middle Ages, when they were given by peasants in various parts of Germany and Bohemia. In modern times the Passion play has acquired renown through its presentations at Ober-Ammergau, Bavaria.

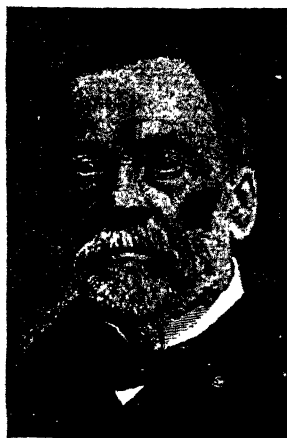
**Passion Week,** a name sometimes given to Holy Week, or the week immediately preceding Easter. But, by the proper usage, Passion Week is that which precedes Holy Week, commencing on Passion Sunday, the fifth Sunday in Lent.

**Passover,** one of the three great Hebrew feasts, the legal institution of which is traditionally connected with the Exodus from Egypt. What this primitive Passover was we cannot accurately determine; but the view of Wellhausen, that it was the offering of the firstlings of the flock is generally adopted. As the season for this was the Spring, and roughly coincided with the beginning of harvest, there came to be combined with the Passover the agricultural feast of unleavened bread, which the Israelites may have adopted when they became resident in Canaan. From Talmudic sources we gather much as to Passover customs in connection with the Last Supper. First the cup of consecration, over which the master of the house had pronounced a blessing, was drunk; then hands were washed and the meal served, consisting of bitter herbs, cakes of unleavened bread, a sauce called *haroseth*, made from dates, raisins, and vinegar, the paschal lamb, and the flesh of subsidiary sacrifices. The master of the house dipped a morsel of unleavened bread into the haroseth, and ate it, and a similar 'sop' was given to every one present. Afterward the paschal lamb was eaten, and three other cups of wine were drunk at intervals with thanksgiving and singing of the Hallel.

**Passport,** a document issued by the government of a country to one of its citizens or subjects, certifying to his nationality, and asking permission for him to travel freely and with due protection in foreign countries. In the United States, passports can be obtained only from the Department of State on an application, and issued only to United States subjects. A passport is usually valid for two years and cannot be extended beyond that time. In foreign countries, emergency passports may be obtained from embassies and legations upon applications made directly through American consulates.

**Passy, Frédéric** (1822-1912), French political economist, was born in Paris. He was one of the founders and was general secretary of the International and Permanent League of Peace, organized in 1867, and in 1888 with M. W. Randal-Cremer he founded the Interparliamentary Union for Arbitration and Peace. In 1901 he shared the first Nobel Peace Prize with M. Henri Dunant.

**Pasta, Giuditta (Judith)** (1798-1865), Italian opera singer. From 1823 to 1833 was the period of her greatest triumphs, which were won principally in London and Paris. Her most important rôles were Medea, Desdemona, Semiramide, La Sonnambula (the opera of this name was written for her by Bellina), Nina, Camilla, and Giulia in *Romeo e Giulia*.



Louis Pasteur

**Pasteboard,** properly a thick paper made by pasting together several finished sheets; but it has been largely superseded by *card-board*, made by superposing several leaves

of pulp at the time of passing under rollers in the process of manufacture.

**Pastel**, or **Crayon Drawing**, the name applied to a method of painting with color which has been mixed into a paste and formed into a stick or crayon. It is used dry and applied directly, and is blended by rubbing in with the forefinger. Pastel painting was practiced in Germany in the 17th century. It became a favorite medium for portraiture with certain artists in Italy, France, and England in the 18th century, after the Venetian lady Rosalba Carriera (1675-1757) brought the pastel to perfection during her stay in Paris in 1720. In recent years, and more particularly in France, successful efforts have been made to revive interest in the pastel, and it has been used for subjects of all kinds. Whistler, M. Léon l'Hermite, Sir James Guthrie, William M. Chase, and J. W. Champney have been among its celebrated exponents.

**Pastes**, agglutinant compounds in which wheat or rye flour or starch is the chief ingredient. They are non-fluid mixtures, that are better adapted to certain requirements than liquid mudlage.

**Pasteur, Louis** (1822-95), French chemist and bacteriologist, was born in Dole. Pasteur's researches, alike in chemistry and bacteriology, are marked by their brilliancy and epoch-making character. He discovered the facets on tartrate crystal and what are called left-handed tartrates. He also discovered the irresolvable mesotartaric acid, investigated the active and inactive malic acids, and by this work laid the foundation of the modern stereo-chemical ideas. Pasteur's next research was into the process of fermentation, which he showed takes place only when the sugary liquid is in the presence of a definite organism. The practical result of these labors was to show that the remedy for the 'diseases' of wines, vinegar, and beer is to make sure that in the fermentations by which they are severally obtained the proper organism, and that only, is present. In this connection he published his *Etudes sur la Bière* (1876), the master work on the subject. Pasteur's attention then turned more into the line of pathological research, the trend of his investigations being influenced by a study of the silkworm disease. This disease, he showed, is of two kinds, both of bacterial origin, and these, after a time, he successfully combated. He next attacked the ques-

tion of anthrax, and isolated the bacillus—a discovery which led to his demonstration that various diseases are due to organisms, and initiated his preparation of 'vaccines' to render the higher animals and man immune to their action. These vaccines have proved to be of the utmost service in the treatment of anthrax, fowl cholera, rabies, and diphtheria. Pasteur's labors, though keenly opposed as they were announced, soon met with almost universal acceptance, and Pasteur institutes of preventive medicine have been erected all over the world.

**Pastille**. The term is applied to small cones containing charcoal, saltpetre, and aromatic gums, which slowly burn away when ignited, giving off a pleasant-smelling smoke.

**Paston Letters**, a collection of over a thousand letters and papers, mostly written by or to particular members of the Norfolk family of Paston, and covering almost the whole 15th century (1422-1509). They are of special value as giving a glimpse into the life of England during the Wars of the Roses.

**Pastor**, or **Rose Colored Starling**, an Old World bird distinguished by a long crest on the head. This, together with the head, wings, and tail, is of a glossy black color, while the black and under surface are rosy pink. The bird winters in India, and has an extensive breeding area in Asia and Europe.

**Pastoral**, a literary convention by which an imaginative idealization of the life of shepherds becomes the material for fable and song. The pastoral has its origin in the actual folk song of the Greeks of Sicily. It received literary form in the last *Daphnis* of Stesichorus of Himera and in the half-artificial *Eclogues* of the Alexandrine Theocritus. Virgil Latinized the mode in his *Bucolics*. The pastoral survived among the Latin poets of the Middle Ages, and was popular with such humanists as Petrarch, Erasmus, and Baptista Spagnuoli of Mantua. The earliest English writers of pastoral, such as Alexander Barclay and Barnabe Googe, confined themselves mainly to the formal eclogues. It was the *Shepherd's Calendar* of Edmund Spenser (1580) that gave Elizabethan pastoral its great vogue. But the pastoral spirit overflowed into other forms; into drama with Peele's *Arraignment of Paris* (c. 1581), Fletcher's *Faithful Shepherdess* (c. 1608), and Johnson's *Sad Shepherd* (c. 1637); into romance with Sidney's

*Arcadia* (1590), and many of the pamphlet stories of Thomas Lodge and Robert Greene; into the sonnet with Lodge's *Phyllis* (1593); above all, into the lyric with innumerable songs and madrigals of Lodge, Greene, Nicholas Breton, Thomas Campion, Robert Herrick, Andrew Marvell, and many another writer. Several of these are to be found in *England's Helicon* (1600) and other anthologies of the day. From the days of Moschus' lament over Bion, the pastoral had been held as an appropriate setting for the funeral elegy. Spenser wept for Philip Sidney in *Astrophel* (1505), Milton for Edward King in *Lycidas* (1637).

**Pastoral Letter**, a circular letter to the clergy, or to the congregation, issued by the bishop of a diocese, and ordered to be read from the pulpit at the time when the ordinary sermon is preached.

**Pastoral Staff**, the emblem of his pastoral office borne by a bishop or by his chaplain. It is usually in the form of a shepherd's crook, and is often very highly ornamented and set with jewels.



*Pastoral Staff.*

**Pastoral Theology**, that branch of theological science which regards the duties and obligations of pastors in relation to the care of souls.

**Pastorius, Francis Daniel** (1651-1719), American colonist, was born in Sommerhausen, Franconia, Germany. He was one of the founders of Germantown, and was the first bailiff of the town. He was also a member of the colonial assembly, and is chiefly remembered for having drawn up, with three others, the first public protest against the holding of slaves ever made in America.

**Pasture**, in its general meaning, has reference to lands devoted to the grazing of live

stock. In a more limited sense, especially as used in the United States, it means a paddock, or enclosed lot or meadow in which stock is fed on the growing grass. The great natural pastures of the West, which are becoming less extensive as the land is brought under cultivation, are called *ranges*, while similar areas in South America are known as *pampas*, and in Asia as *steppes*. A pasture crop may consist of mixed grasses and clovers, or other leguminous plants. Such a crop usually occupies the land for many years, and is then called permanent pasture. The following is a list of the grasses usually sown in pastures: Kentucky blue grass, Canada blue grass, tall fescue, reedtop, perennial rye grass, orchard grass, timothy.

**Patagonia**. The southern part of South America, from Rio Colorado to Cape de las Virgenes, is generally known as Patagonia.

**Patan**, walled town, Baroda state, Bombay, India. It manufactures swords, spears, and silk and cotton goods. It has over a hundred Jain temples; p. 32,000.

**Patanjali**, Indian philosopher of the 2d century B.C., was the founder of the Yoga school of Hindu philosophy. Patanjali is also credited by some with the authorship of the *Mahâbhâsya*, a commentary on the *Sutras* of Panini.

**Patara**, ruined city, Asia Minor, in Lycia, was the chief seat of the worship of Apollo. The remains comprise Greek tombs, ruins of churches, a theatre, and a triple arch.

**Patchogue**, village, New York, on Long Island. Paper, surveyors' supplies, and lumber are manufactured; p. 7,181.

**Patchouli**, a Hindu perfume, obtained from a soft-wooded shrub, *Pogostemon patchouli*, growing from two to three feet in height, and bearing dense spikes of purplish white flowers and broadly ovate leaves. The plant is a native of Silhet, the Malay coast, Ceylon, Java, the neighborhood of Bombay, and probably also of China.

**Pâté de Foie Gras** (French 'paste of fat liver'), or **Strassburg Pie**, a dish made from the livers of fattened geese or ducks. The latter are fed large quantities of salted maize, thus enlarging the liver until it weighs from one to three pounds. The principal places of manufacture are Toulouse, France, and Strassburg, Germany.

**Paten** (Latin *patina*, 'a dish'), a small circular plate, employed for the wafers of

bread in the eucharistic service. It is always of the same material as the chalice, often richly chased or carved, and studded with precious stones.

**Patent**, or **Letters Patent**, in the most general sense, any grant by the government to an individual of any property, right, privilege, or title; specifically, the grant by the government to an individual of the exclusive right for a limited term to manufacture and sell a useful article invented by him. The policy of encouraging inventions by statutes that secure to inventors the exclusive right to control the production and sale of the invented article for a term of years dates back to the 16th century in England, and to the colonial period in the United States. In both those countries, as well as in other civilized states, this policy has been developed into an elaborate system, under which the respective rights of the patentee, of competing inventors, and of the public are carefully defined and protected; while by means of international conventions the privilege of patenting an invention has been extended to foreign countries. Applications for letters patent of the United States must be made to the Commissioner of Patents, be signed by the inventor. Infringement consists in the unlawful *use*, *sale*, or *manufacture* of a patented article without the consent of the patentee or owner.

**Patent Medicines**. In a legal sense, a patent medicine is one whose composition or method of making, or both, has been patented. Much confusion exists as to the distinction made between *proprietary medicines* and *patent medicines*. Practically all nostrums on the market are proprietary, while only a few have actually been patented. In general, all nostrums advertised and sold direct to the public are termed patent medicines, while those advertised directly to physicians only are spoken of as proprietary. Therefore a true patent medicine is not a secret preparation, because its composition must appear in the patent specification.

**Pater**, **Walter Horatio** (1839-94), English essayist and critic, born in London. A visit to Italy in 1865 turned his thoughts toward Italian art and humanism and resulted in the publication of his *Studies in the History of the Renaissance* (1873). His works include: *Marius the Epicurean* (1885); *Imaginary Portraits* (1887).

**Paterculus**, **Gaius Velleius** (c. 19 B.C.—

c. 31 A.D.), Roman historian. His chief work is the *Historia Romana*, a compendium of universal, and especially of Roman history, beginning with the fall of Troy and ending with the events of 30 A.D.

**Paternoster**, (Latin, 'Our Father'), also known as **The Lord's Prayer**, a form of prayer presented by our Lord to His disciples as the model according to which their petitions should be framed. In Roman Catholic devotional usage the Paternoster is combined with the Ave Maria to form the Rosary.

**Paterson**, city, New Jersey. Paterson is the third industrial city of the State and the chief silk-producing center of the United States. Because of the vast water power obtainable from Passaic Falls, the site of Paterson was selected in 1792 by the Society for Establishing Useful Manufactures, and the town was named in honor of William Paterson. Alexander Hamilton interested himself in its founding and prepared its original charter; p. 139,656.

**Pathology**, (from the Greek *pathos*, 'disease,' and *logos*, 'a discourse'), is that department of medicine which treats of the doctrine of diseases, their nature, causes, symptoms, and progress. The science of pathology may be regarded as a branch of biology, and though it embraces the diseases of all living matter, plant and animal, it is chiefly concerned with the morbid conditions found in the human species. For convenience the science is usually divided into general and special pathology. General pathology includes affections of the circulation and blood, inflammation, retrograde or degenerative changes, hypertrophy, repair, tumors, parasites, and malformations. In special pathology morbid manifestations in individual organs are considered.

Modern pathology may be said to have first taken its place amongst the sciences with the publication, in 1858, of Virchow's great book, *Cellular Pathology* (Eng. trans. 1860). Since that time great progress has followed the use of high-power microscopes, stains, and culture media. Modern pathology is now largely occupied with the study of pathogenic micro-organisms, their effect on the body, and the problems of natural and artificial immunity. One remarkable development of pathological investigation is the administration of protective serums derived from animals which have been rendered immune by bacteria and bacterial products. Another direct result of the recognition of the

part played by various glands in the production of disease is the treatment of various maladies by the administration of animal substances. Investigation of the blood has opened a way to the eradication of malaria, yellow fever, and sleeping sickness by an attack upon the mosquito and tse-tse fly, which communicate these diseases to man. As a result of these discoveries it is now possible for white men to live in the tropics in comparative safety.

**Patmore, Coventry Kersey Dighton** (1823-96), English poet and critic, was born at Woodford in Essex. He published *Poems* (1844); *Tamerton Churchtower* (1853); *The Angel in the House*; *The Unknown Eros*.

**Patmos**, one of the islands of the Sporades, in the Ægean Sea, lying off the coast of Asia Minor, is famous as the place of banishment of St. John the apostle, who is traditionally believed to have written there the Book of Revelation. Its modern name is Patino, the most important feature of which is the 11th-century monastery of St. John; p. 2,550.

**Paton, Sir Joseph Noel** (1821-1902), Scottish religious painter in the pre-Raphaelite manner, also poet, born in Dunfermline. His *Spirit of Religion* gained a government prize of £200; and another of £300 was awarded to his *Reconciliation of Oberon and Titania*. Among his best-known pictures are *The Pursuit of Pleasure*, *Mors Janua Vitæ* (1860), *Lux in Tenebris*.

**Patræ, or Patras**, one of the twelve cities of the Achæan confederacy in ancient Greece. It is now one of the chief ports in Greece, its modern name being Paltras. Its principal exports are currants, olives and olive oil, and lemons; p. 37,958.

**Patriarch**, a name signifying generally the head or father of a race. The word was used also as a title in the Christian Church, first given to bishops generally as a mark of respect and later as an official title limited to the bishops of Alexandria, Antioch, Constantinople, and Jerusalem.

**Patricians**, the ruling class in ancient Rome. Birth alone made a patrician, though occasionally foreign noble families, such as that of the Claudii, were admitted.

**Patrick, St.**, the apostle of Ireland, was probably born at Bannaventa (in Northamptonshire, England, near Daventry), where he was captured when sixteen years old by a raid of predatory Irish. Carried to North Ireland, he spent six years there as a slave. Then he escaped, went to Gaul, where he became a monk, and later, having received the papal

benediction (about 431), returned to Ireland as a missionary. He established the see of Armagh, and is said to have 'found all Ireland heathen and left it wholly Christian.' Tradition puts his death in 492 or 493, but 463 is considered a more probable date. See Todd's *St. Patrick* (1864), Healy's *Life and Writings of St. Patrick* (1905), Bury's *Life* (1905), and *Life of St. Patrick* by M. F. Cusack.

**Patriotic Societies.** In the United States, organizations in which the members are bound together for patriotic work, and in many cases eligibility is dependent upon descent from an ancestor who participated in the event which the society commemorates.

**Colonial Period.**—The *Society of Mayflower Descendants*, organized in New York City on Dec. 22, 1894; the *Society of Colonial Wars*, organized in New York City on August 18, 1892; the *Order of Founders and Patriots*, incorporated in New York City on March 18, 1896; the *Holland Society*, of New York City, organized on April 6, 1885; the *Society of Colonial Dames in America*, organized in New York City on May 23, 1890; the *National Society of Colonial Dames of America*, organized in Wilmington, Del., May 19, 1892; *Society of Daughters and Patriots of America*, organized in Washington city on June 7, 1898; *Society of the Daughters of the Holland Dames*, organized in New York City on Dec. 9, 1895.

**Period of the Revolution.**—The oldest organization is the *Society of the Cincinnati*, founded in Newburgh, N. Y., on May 13, 1783, for the preservation of the friendships formed under the pressure of common danger during the War of the Revolution. It admits to membership male descendants of officers who served in the Continental army for at least three years. There are state societies in the thirteen original states; *California State Society of the Society of the Sons of the American Revolution*, organized in New York City on April 30, 1889; *Sons of the Revolution*, organized in New York City on Feb. 22, 1876; *Naval Order of the United States*, organized in Boston, Mass., on July 4, 1890; *Military Order of Foreign Wars*, instituted in New York on Dec. 27, 1894; *Society of American Wars*, formed in Minneapolis on June 11, 1897; *Military Order of the French Alliance* in the United States and France, instituted on Feb. 17, 1903; *Daughters of the American Revolution*, organized in Washington on Oct. 11, 1890; *Daughters of the Revolution*, organized in New York

City on August 23, 1891; *Daughters of the Cincinnati*, organized in New York City on Dec. 28, 1894; *Dames of the Revolution*, organized in New York City on June 25, 1896; *Society of the Children of the American Revolution*, organized in New York City on April 5, 1895.

*Period of the War of 1812.*—*Military Society of the War of 1812*, incorporated in New York City on Jan. 8, 1892; *General Society of the War of 1812*, organized in Philadelphia on Jan. 8, 1891; *Society of the United States Daughters of 1812*.

*Period of the War with Mexico.*—*The Aztec Club of 1847*, organized in the City of Mexico on Oct. 13, 1847; *Association of Mexican Veterans*; *Dames of '46*.

*Period of the Civil War.*—*The Military Order of the Loyal Legion*, organized in Philadelphia on April 15, 1865; *Grand Army of the Republic*, organized in Decatur, Ill., on April 6, 1866; *Woman's Relief Corps*, organized in July, 1883; *Sons of Veterans*, organized in Philadelphia on Sept. 29, 1879; *Union Veteran Legion*, organized in Pittsburgh in March, 1884; *Ladies of the Union Veteran Legion*; *Union Veteran Union*, founded in Washington in 1886; *Regular Army and Navy Union of the United States*, organized in Cincinnati in March, 1888; *Medal of Honor Legion*; *United States Veteran Navy*; *National Association, Ladies of Naval Veterans*; *National Association of Naval Veterans*, organized in 1887; *Society of the Army of the Cumberland*, *Society of the Army of the Potomac*, *Society of the Army of the Tennessee*; In the Southern states are the *United Confederate Veterans*, organized in New Orleans on June 10, 1889; *United Sons of Confederate Veterans*, organized in Richmond on June 30, 1896; and the *United Daughters of the Confederacy*, organized in Nashville, Tenn., on Sept. 10, 1894.

*The Period between the Civil War and the War with Spain.*—*Society of Veterans of Indian Wars*, organized in Philadelphia on April 23, 1896; *Order of the Indian Wars of the United States*, organized in Chicago on July 26, 1896.

*Period of the War with Spain.*—*Naval and Military Order of the Spanish-American War*, organized in New York City on Feb. 2, 1899; *Rough Riders' Association*; *National Society of the Army of the Philippines*.

*Miscellaneous.*—There are also numerous societies which have as their special object the bringing together of persons united by a

common tie of interest in some special locality. Of these, the *Society of California Pioneers*, the *New England Society*, and the *Ohio Society in New York*, are typical. There are also many patriotic organizations which have as their special object the preservation of some historic home or place.

**Patrol**, a body of carefully selected men, the strength of which depends upon the purpose for which organized, sent out under special leaders for reconnaissance of the enemy's position to obtain information of his numbers and dispositions, to harass his outposts, make maps of the surrounding country, etc.

**Patron**, a term in use in ancient Rome to describe the relation in which a citizen of position stood to his 'clients' or dependents.

**Patroons** (Dutch, *patroon*, *patron*). The name applied to those settlers in New Netherland (New York) to whom special privileges were granted. The Dutch West India Company at first paid little attention to the permanent settlement of its territory, but in 1629 issued by consent of the States General, the 'Freedoms and Exemptions' to the patroons of New Netherland. All members of the company who should within four years plant a colony of fifty persons over fifteen years of age might select a tract of land. Over this territory the patroon was given a monopoly of grinding, hunting, fishing, and mining. Authority over any towns which might spring up was granted and also the first right of purchasing the produce of the tenants. The first patroonships established were Zwanendael on the Delaware, and Rensselaerwyck on the Hudson, which latter, with additions afterwards made, extended 24 miles on each side of the river, and the same distance back, the territory including nearly the whole of the present counties of Rensselaer and Albany. In 1775, at the outbreak of the Revolution, primogeniture and feudal tenure were abolished, and the manors became simply large estates subject to division.

**Patten, Simon Nelson** (1852-1922), Am. economist, born Sandwich, Ill. His chief publications are: *The Stability of Prices* (1888); *The Consumption of Wealth* (1889); *The Economic Basis of Protection* (1890); *The Theory of Property* (1901); *Heredity and Social Progress* (1903).

**Patterson (Bonaparte), Elizabeth** (1785-1879), the American wife of Jerome Bonaparte. They met in Baltimore, and were married in 1803. Napoleon was incensed and prevailed upon his brother to give up his

American bride. The marriage was annulled by the French council of state in 1806. In 1807 Jerome was crowned king of the newly created kingdom of Westphalia. In the same year he married Princess Catherine of Württemberg. His first wife could get no recognition from the Bonapartes except that her son might bear that name. A grandson, Charles Joseph Bonaparte, became U. S. attorney-general in 1906.

**Patterson, Daniel Tod** (1786-1839), American naval officer, born on Long Island, N. Y. In 1814-15 he had charge of the naval defense of New Orleans, seized the stronghold of the famous Baratian pirates, and performed valuable services in assisting Jackson against the British under Pakenham.

**Patterson, Robert** (1792-1881), American soldier, born in Cappagh, Tyrone co., Ireland. When the Civil War broke out he was given command of the forces which were to invade the Shenandoah region of Va. When the first march toward Richmond was begun, he was instructed to engage Gen. Joseph E. Johnston, and by his dilatoriness in permitting Johnston to escape him he was largely responsible for the defeat at Bull Run.

**Patterson, Robert P.** (1891- ), American public official, was born in Glens Falls, N. Y.; was educated at Union College and Harvard Law School. He was captain in the 306th Infantry, 1917; was awarded the Distinguished Service Cross for extraordinary heroism in action. He was appointed judge in the U. S. District Court, New York, 1930, and in the Circuit Court of Appeals, 1939. He was appointed Asst. Secretary of War, 1940; Under-Secretary, 1940-45; Secretary of War, 1945-

**Patti, Adelina, Baroness Cederström** (1843-1919), prima donna, born at Madrid, of Italian parents, was brought up in New York. She made her début in opera at New York (1859) as Lucia and in 1861 appeared at the Royal Italian Opera, London, in *La Sonnambula*.

**Patton, Francis Landey** (1843-1932), American clergyman and educator. He took a leading part in the prosecution of Prof. David Swing and of Dr. C. A. Briggs for heresy. From 1888 to 1902 he was president of Princeton University.

**Patton, George Smith, Jr.** (1885-1945), U. S. army officer, was born in San Gabriel, Cal., educated at Pasadena, Va. Military Institute, U. S. Military Academy, Cavalry School, Command and General Staff School, War College. He was aide-de-camp to Gen.

Pershing in Mexico and in World War I: was made Lieut.-General, 1943; led his men to victory in N. Africa, Sicily, Italy, France, Belgium, Luxembourg, Germany, and Czechoslovakia. He was made 4-Star General, 1945.

**Paul, The Apostle**, was born at Tarsus of Cilicia. His father was a Jew, who had received the Roman citizenship, so that the son was 'freeborn.' On his way to Damascus he had the vision of Jesus which changed his career. After his meeting with Ananias in Damascus and his baptism, Paul went down to Arabia for three years. He went to Jerusalem, and proclaimed his new faith where he had most bitterly opposed it. His conception of Christianity, and not circumstances, determined his career. Forthwith he returned to Tarsus, worked for some years in Syria and Cilicia, and, after another year of work in Antioch of Syria, was sent up with Barnabas to Jerusalem as the bearer of contributions to the mother church, which was suffering from the famine of 44 A.D. Crossing to Perga, they made their way through the Taurus Mts. to Antioch of Pisidia, evangelized and founded churches in Iconium, Lystra, and Derbe.

The conversion of Luke, a Macedonian physician, was followed by a vision in a dream which summoned Paul to Europe. He accordingly made his way to Neapolis, and thence through Philippi, Thessalonica, Berea, and Athens to Corinth. In Macedonia and Greece he met with considerable success, though the culture of Athens mocked the apostle's enthusiasm. The Epistles to the Thessalonians, which were probably written about this period, show the gospel that Paul preached. From Corinth Paul returned to Jerusalem by way of Ephesus, and thence made his way to Antioch. About this period he wrote his three great doctrinal epistles. In those to the Galatians and the Corinthians he works out his fearless confidence that Christianity is a new creation of God in faith and morals; that it needs no completion, and can brook no rivals. The Epistle to the Romans is a calmer statement of his position.

From Corinth he set out to keep the feast of Pentecost at Jerusalem. But no sooner was the apostle recognized in the court of the women than a popular tumult arose against this contemner of the traditions of the fathers. When the apostle, however, was brought before Festus, he appealed to the imperial court at Rome. In charge of a centurion, Julius, the prisoner was sent to Myra, and thence conveyed in an Alexandrian wheat-

ship to Crete. The vessel, however, was caught in a hurricane, and suffered shipwreck at Malta. Paul, with the ship's company, was transferred to the *Castor and Pollux*, brought to Puteoli, and thence by land to Rome. Thence Paul wrote his Epistles to the Colossians and Ephesians, which put the copestone on his structure of Christian doctrine.

**Paul**, the name of five popes. **PAUL I.** (757-767), was brother of Stephen II., whom he succeeded.—**PAUL II.**, **PIETRO BARBO** (1418-71), pope from 1464, was born at Venice.—**PAUL III.**, **ALESSANDRO FARNESE** (1468-1549), pope from 1534, was born at



*Adelina Patti.*

(Photo by Ellis & Walery.)

Canino in Tuscany. In 1538 he excommunicated Henry VIII. of England.—**PAUL IV.**, **GIOVANNI PIETRO CARAFFA** (1476-1559), pope from 1555, was the nephew of Cardinal Oliviero Caraffa. He widened the schism between the Anglican Church and Rome by declaring Elizabeth illegitimate.—**PAUL V.**, **CAMILLO BORGHESI** (1552-1621), pope from 1605, was born at Rome. His reign is marked by zealous repression of heresy and active encouragement of missionary enterprise.

**Paul I.** (1754-1801), emperor of Russia, son of Peter III. After the murder of his father, the throne was usurped by his mother, Catherine II. On her death in 1796, Paul ascended the throne. He was at length assassinated, his actions having strongly savored of insanity.

**Paulding, James Kirke** (1779-1860), American author. He was born in Pleasant Valley, Dutchess co., N. Y. His first literary work was *Salmagundi* (1807), a humorous

publication after the manner of the *Spectator*, written with William and Washington Irving. From this time on he wrote a good deal, and is a typical, if not the greatest, representative of the Knickerbocker literature of the first half of the nineteenth century. His works include, *The Book of St. Nicholas* (1827), *The Dutchman's Fireside* (1831), a *Life of George Washington* (1835).

**Paulding, John** (1758-1818), American patriot, born in New York City. On September 23, 1780, with two others, Isaac van Wart and David Williams, he arrested Major André at Tarrytown, on the Hudson, as that officer was on his way back to New York from an interview with the traitor Arnold. They were each presented by Congress with a silver medal bearing on one side the inscription 'Fidelity' and on the other '*Vincit amor patriæ*,' and in addition they received an annuity of \$200.

**Pauli, Reinhold** (1823-82), German historian, born at Berlin. Lappenberg committed to him the task of completing his *Geschichte von England*; and Pauli's portion, comprising the period from Henry II. to Henry VII. (3 vols. 1853-8), is still unsurpassed as a history of mediæval England. Among his other works are *Simon de Montfort, Earl of Leicester* (Eng. trans. 1876); *Oliver Cromwell* (Eng. trans. 1888); and an edition of Gower's *Confessio Amantis* (1856).

**Paulicians**, a heretical sect which is first mentioned in Armenia in 719. They were numerous and aggressive in Syria and Armenia in the 9th century and penetrated into southeastern Europe. Remnants of them were found in Armenia in the 19th century, and one of their ancient books, *The Key of Truth*, was discovered there.

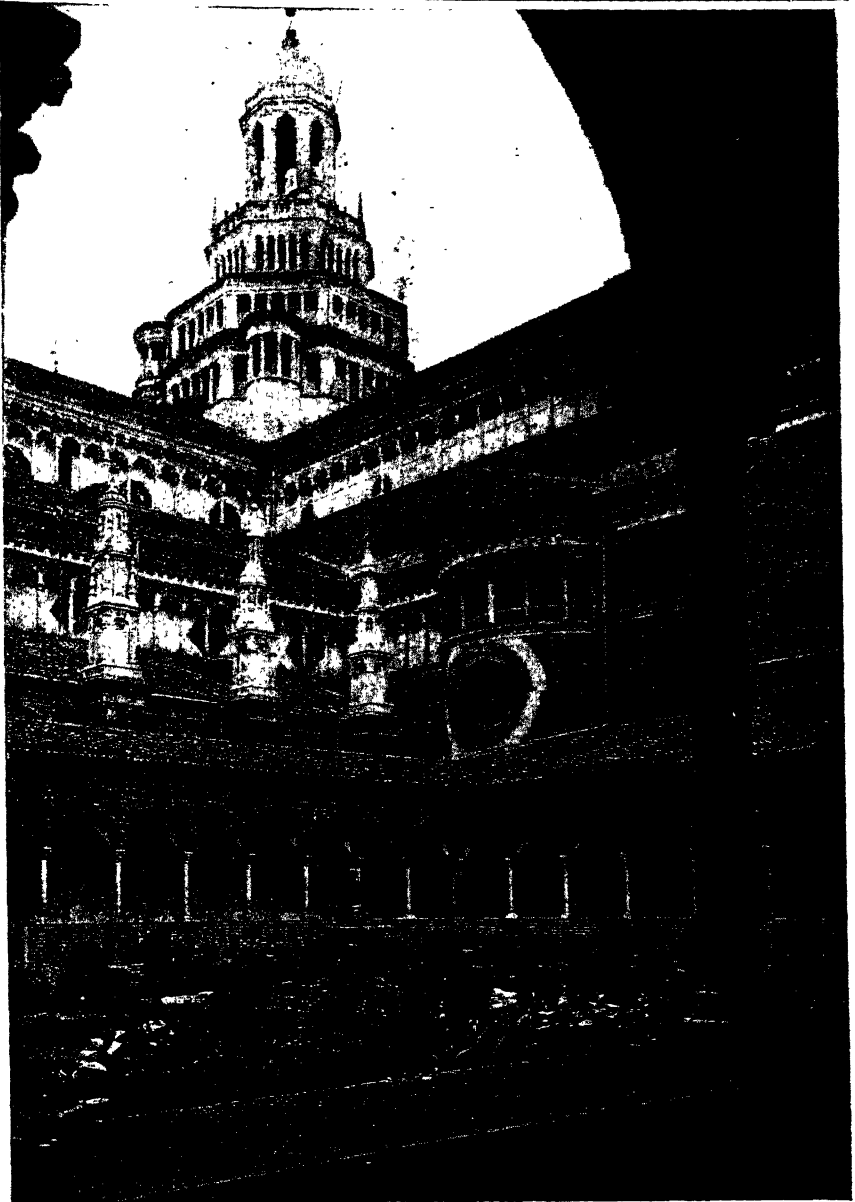
**Paullinia**, a genus of evergreen tropical shrubs, mostly climbing plants, belonging to the order Sapindaceæ.

**Paulownia**, a genus of hardy deciduous trees belonging to the order Scrophulariaceæ. It is easily grown for its flowers s. of New York, in the East, and may be propagated by means of cuttings.

**Paulus Diaconus** (c. 720-800), historian of the Lombards. His most important work, *De Gestis Langobardorum*, was written about 786. Other works by him are *Gesta Episcoporum Mettensium*, an account of the Carolingians.

**Pauncefote of Preston, Julian, First Baron** (1828-1902), British diplomat, born at Munich, Germany. In 1889 he succeeded Sackville-West as British minister to the





*Elmendorf Photo, © Ewing Galloway, N. Y.*

*Certosa Di Pavia, Carthusian Monastery.*

United States, a title which was changed in 1893 to that of ambassador. To the thirteen years he was in Washington belong the Bering Sea fishery dispute, and other Canadian matters; the arbitration treaty successfully negotiated between himself and Richard Olney, but wrecked by the Senate; the Venezuela affair; and the Hay-Pauncefote treaty in amendment of the Clayton-Bulwer treaty. The establishment of The Hague Court of

Arbitration was largely his achievement.

**Pauperism**, a condition of life in which one depends for his maintenance, either in whole or in part, upon someone other than his natural supporter.

**Paur, Emile** (1855-1932), American musical conductor, was born in Czernowitz, Austria. In 1893 he was made director of the Boston Symphony Orchestra, remaining with that organization for five years. For two years (1898-1900) he conducted the concerts of the Philharmonic Society of New York, and for a season was conductor of the German works given at the Metropolitan Opera House. From 1904 to 1910 he was director of the Pittsburgh orchestra, doing much to make its concerts noteworthy. In 1912 he succeeded Karl Muck as conductor at the Royal Opera in Berlin.

**Pavement**, the hard covering of the surface of a road or footway, commonly composed of macadam, granite blocks, brick, sheet or block asphalt, or wood for vehicular traffic, and blue flag-stones, cement or tar concrete and brick for sidewalks. The prime essential of good pavement is an unyielding, permanent foundation, the pavement proper serving as a wearing surface only, and deteriorating rapidly if the foundation yields. The high cost of pavements makes it a matter of considerable importance that they be kept in repair. For thousands of years the art of adding decorative interest to stone pavements has been known and practiced with striking effect both in the exterior and interior of buildings. This is especially true in the countries of Europe, notably Italy, the beautiful pavements of Siena being world famous.

**Pavia**, province, Italy, in Lombardy; area 1,114 sq. miles. The southern part is mountainous; the northern part a fertile plain traversed by the Po and its tributaries. The principal products are rice, wheat, rye, chestnuts, fruit, wine, and silk; p. 469,000.

**Pavia**, town and episcopal see, Italy, capital of the prov. of Pavia, on the River Ticino; 18 miles s. of Milan. Features of interest are the Cathedral, which dates back to 1488; the University, said to have been founded by Charlemagne in 774, and restored by Galeazzo Visconti, Count of Pavia, in 1361; the churches of San Michele, San Pietro in Ciel d'Oro, and Santa Maria del Carmine. Five miles n. of the town is the famous Carthusian monastery, Certosa di Pavia. Church councils were held here in 1081, 1160, and 1423. Here, also, in 1525 was fought the great battle which resulted in the defeat of the French

and the capture of their king, Francis I., by the troops of the Emperor Charles V.; p. c. 50,240.

**Pavlov or Pawlov, Ivan Petrovich** (1849-1916), Russian physiologist, was born in Rjasau. In 1888 he began the study of the activities of the digestive glands, which may be considered his most important work. He received the Nobel prize in 1904, was a member of the Royal Society, and the recipient of various medals and honors for his scientific achievements.

**Pavlowa, Anna** (1885-1931), Russian dancer, was born in St. Petersburg, now Leningrad. She was trained for the ballet at the Imperial Ballet School and eventually became *prima ballerina* at the Marianski Theatre and later at the Imperial Opera House. She made her debut in London in 1910, scoring an immediate success, and soon appeared in Paris and in New York, where she met with unqualified praise. She toured the world with her own company and is considered by most critics as unrivalled in her field. Among her greatest successes are *Le Cygne*, *Les Papillons*, *Coppelia*, *La Nuit Egyptienne*, and *Les Sylphides*.

**Pawnbroker**, one who carries on a business of lending money in comparatively small sums, taking goods and chattels as security for payment.

**Pawnees**, a confederacy of North American Indians, the chief branch of the Caddoan family, whose original domain comprised a large part of Texas, Louisiana, and Arkansas. The Pawnees lived in villages of conical log houses covered with earth, similar to those of the Mandans, and devoted themselves to agriculture except for a part of the year spent on the plains, hunting buffalo, at which times they dwelt in tepees of buffalo skins, similar to those of the roving plains tribes. In 1876 nearly all the Pawnees were removed to reservations in Indian Territory (now Oklahoma).

**Pawtucket**, city, Rhode Island, Providence co., at the head of navigation on the Pawtucket River. The city is built on both sides of the river. Cotton-spinning in the United States had its origin in Pawtucket, where it was introduced from England by Samuel Slater in 1790; p. 75,797.

**Paxson, Frederic L.** (1877- ), American educator and historian, was born in Philadelphia. During the Great War (1914-18) he was chief of the Economic Mobilization Section, Historical Branch, General Staff, U. S. A., with the rank of major. His most

important publications are *The Last American Frontier* (1910); *The New Nation* (1915); *Recent History of the United States* (1920). He edited, also, the *War Cyclopædia* issued by the Committee on Public Information (1920), and *Handbook of Economic Agencies for the War of 1917*, issued by the General Staff, U. S. A. (1919).

**Paxton, Sir Joseph** (1801-65), English architect and gardener, was born at Milton-Bryant, Bedfordshire. He designed the Crystal Palace at Sydenham, and superintended its construction. He edited the *Horticultural Register* (1832-36), *Paxton's Flower Garden* (1850-3), and *Botanical Pocket Dictionary* (1840).

**Paymaster**, in the U. S. Navy, an officer whose duty it is to keep accounts of appropriations made by Congress, to pay the officers and men, purchase provisions, clothing, and other needful stores, and act as commissary officers for the enlisted forces of ships to which they are attached.

**Payment**. Strictly speaking, payment is the discharge of a debt or obligation by the payment of money, but the term is used in a looser sense to indicate any discharge of an obligation whether by money or goods or other form satisfactory to the creditor. The effect of payment is to discharge the obligation, except in that certain cases where it is made by a surety or person secondarily liable the claim of the creditor may be enforced by the person paying the debt, under the doctrine of subrogation.

**Payne, Henry B.** (1810-96), American public official, was born in Hamilton, N. Y. In 1885 he succeeded George H. Pendleton in the U. S. Senate, and served until 1891.

**Payne, Henry Clay** (1843-1904), American public official, was born in Ashfield, Mass. In 1896 and 1900 he had charge of the Republican presidential campaign in the West. He declined an appointment as ambassador to Germany in 1897, but in 1902 accepted the position of U. S. postmaster-general in President Roosevelt's cabinet.

**Payne, John Barton** (1855-1935), jurist and public official, born in Virginia, served as a Superior judge in Illinois and was Secretary of the Interior in President Wilson's Cabinet. President Harding appointed him chairman of the executive committee of the American Red Cross, a position he occupied until his death.

**Payne, John Howard** (1791-1852), American actor and dramatist, was born in New York City. He made his début at the Park

Theatre, New York, Feb. 24, 1809, as Young Norval, in Home's *Douglas*, and achieved an immediate success. Payne's opera, *Clari, or The Maid of Milan*, containing his famous song, 'Home, Sweet Home,' was produced at the Covent Garden Theatre in May, 1823, the words being sung by Miss M. Tree. In 1842 he was appointed U. S. consul at Tunis, where he resided until his death.

**Payne, Oliver Hazard** (1838-1917). American financier, was born in Cleveland, Ohio. He gave \$500,000 to Cornell University (1898) towards maintaining a medical department in New York City, and made other large gifts to that and other institutions.

**Payne, Sereno Elisha** (1843-1914), American legislator, was born in Hamilton, N. Y. He was a member of the American-British Joint High Commission to negotiate a reciprocity treaty with Canada, helped frame the McKinley and Dingley tariff bills, and was author of the Porto Rican free-trade tariff bill (1900), which failed in the Senate, and was one of the framers of the Payne-Aldrich Act of 1909.

**Payne, William Morton** (1858-1919), American teacher and literary critic, was born in Newburyport, Mass.

**Paysandú**, town, Uruguay, South America, on the Uruguay River; 200 miles northwest of Montevideo. It is the second port in the country, exporting chiefly preserved meat, cattle, sheep, hides, and wool; p. (1922) 26,000.

**Pea**, a genus of plants, native to Southwest Europe, belonging to the order Leguminosæ, grown for their edible seeds and sometimes for their edible pods. The Garden Pea (*Pisum sativum*) is grown in all temperate climates for its seeds, which are eaten both green and dried, and are preserved by canning. One variety with edible pods, known as the sugar pea, is little cultivated in the United States but is extensively grown in Europe. The Field Pea (*P. arvense*) is grown in the Northern United States, Canada, and Europe, as a hay and grain crop. Seeds of this species are also edible.

**Peabody, Elizabeth Palmer** (1804-94), American educator, was born in Billerica, Mass. Her sisters were married to Nathaniel Hawthorne and Horace Mann. She became interested in kindergarten work, and was among the first to take it up in the United States. Her publications include *Æsthetic Principles* (1849), *Kindergarten Culture* (1870), *A Record of Mr. Alcott's School* (1874), *Reminiscences of Dr. Channing*

(1880), and *Letters to Kindergartners* (1886).

**Peabody, George** (1795-1869), American philanthropist, was born in Danvers, Mass., of old New England stock. In 1813, with George Riggs, he established a wholesale dry goods business at Georgetown. Removing to Baltimore the following year, the firm prospered, and in 1822 opened branches in New York and Philadelphia. Mr. Peabody visited England in 1827, on business for his firm, and repeating his visits, settled permanently in London in 1837. His partner withdrew from the firm in 1829, and in 1843 Mr. Peabody himself retired from Peabody, Riggs & Co., and established in London the firm of George Peabody & Co., as merchants and bankers. He took measures to restore American credit in England, at a time when there was a lack of confidence in American finance.

As his fortune increased in size, Mr. Peabody gave more and more attention to philanthropic work, devoting himself particularly to the better housing of workingmen and to the endowment of educational establishments. His larger American benefactions began with the founding of the Peabody Institute at Baltimore, Md., for which he gave \$1,250,000. To Harvard and Yale he gave \$150,000 each for museums of American archaeology and natural history respectively, and \$140,000 to the Essex Institute, of Salem, Mass., for the Peabody Academy of Sciences. In 1867 he established the Peabody Education Fund, \$3,500,000 in all, for the forwarding of education in the South.

**Peabody, George Foster** (1852-1938), American banker, was born in Columbus, Ga. He has become widely known through his activity in the Southern Educational Board, and upon behalf of the Hampton Normal Institute and kindred organizations.

**Peabody, Josephine Preston** (1874-1922), Am. poet and dramatist, born in New York; ed. at Radcliffe College. Her dramas are *The Piper* (1909); *Marlowe* (1901). Her poems: *The Wayfarers*; *The Singing Leaves*; *New Poems*. *The Piper* won the Stratford-on-Avon prize (1909).

**Peace**, a word which originally carried a negative suggestion as the opposite of war, but now refers to an orderly state of human society which is considered normal rather than exceptional.

*International Peace Movement*.—A world composed of nations, each of which had become accustomed to securing righteousness

and peace within its own borders by means of law and judicial process, was manifestly ready to begin the task of extending into the international realm the principles and institutions which had brought justice and prosperity to each of the nations in its individual life. This process of organizing the world politically is the salient feature of what is known as the International Peace Movement, and in its modern form dates from the First International Peace Conference at The Hague. The Hague Conferences aroused the nations to a united attempt to secure permanent peace by means of law. Through their agency the foundations of three international courts were laid, and a Convention for the Pacific Settlement of International Disputes was negotiated, while the impulse imparted by them led to the signing after 1899 of more than 160 international treaties of obligatory arbitration.

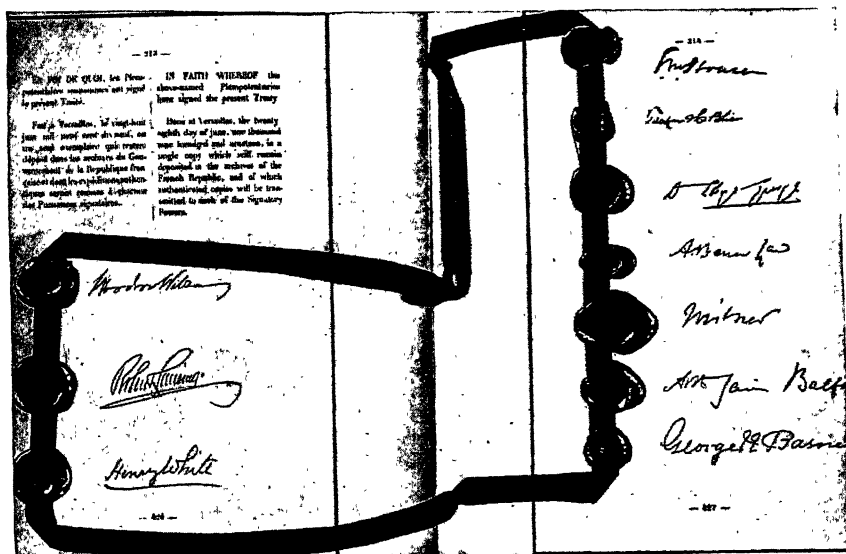
Peace societies and other voluntary agencies for the advancement of peace, to the number of several hundred, have been organized among most or all of the civilized peoples. Several notable benefactions have been made for the promotion of friendly relations between nations. Of these the best known are the Nobel Committee and Institute, founded by the will of Alfred Nobel in 1900; the World Peace Foundation, organized through the munificence of Edwin Ginn of Boston, in 1910, with an annual income of \$50,000; the Carnegie Endowment for International Peace, created by Andrew Carnegie by a gift of \$10,000,000, on Dec. 14, 1910.

The Great War, which in 1914 overwhelmed the countries of Europe and before the signing of the armistice in 1918 had involved twenty-eight nations, demonstrated the impossibility of international peace so long as nations were grouped in opposing alliances, engaged in competitive armaments, and relying for the security of their international position largely upon secret treaties and agreements. It was hoped that the work of the League of Nations and of the Permanent Court of International Justice, established in accordance with the Covenant, would bring about a change in the processes of diplomacy and the conduct of international relations which would make impossible a return of the conditions which resulted in the World War. The treaties signed at Locarno in 1925 was another step which was expected but failed to remove the probabilities of another great war in Europe.

The General Pact for the Renunciation of War signed at Paris on August 27, 1928, marked the most advanced step in modern history in the official progress of the international peace movement. Initiated by Minister for Foreign Affairs Briand as a bilateral treaty between France and the United States, but expanded at the suggestion of Secretary of State Kellogg to include all the other nations of the world, the signatories—Germany the United States, Belgium, France, Great Britain and the British Dominions, Italy, Japan, Poland and Czechoslovakia—solemnly

and was regarded an international paper of first rank. On September 22, 1933, there was signed in Rome a Soviet-Italian treaty of friendship, non-aggression, and neutrality. The outbreak of the European War, 1939, showed the futility of these moves. Consult Hull's *The Peace Movement* (1912); Angell's *The Great Illusion* (4th ed. 1914); *Year Books of the Carnegie Endowment for International Peace* (1911-1929); Hudson's *The World Court* (World Peace Foundation).

**Peace Conference of Paris.** The Conference of Paris (1919), the largest and pos-



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Two Pages of the Peace Treaty, Showing the Signatures of the American and British Delegates.

declare that 'they condemn recourse to war for the solution of international controversies, and renounce it as an instrument of national policy,' and 'agree that the settlement or solution of all disputes or conflicts of whatever nature or of whatever origin they may be, which may arise among them, shall never be sought except by pacific means.' The Pact of Paris met with immediate and universal acceptance, and fifty-four nations became parties to it. It went into effect on July 24, 1929.

The Four Power Pact, signed at Rome on July 15, 1933, by France, Great Britain, Germany and Italy, was designed to safeguard the peace of Europe for ten years. It was instigated by Premier Mussolini, of Italy,

sibly the most important congress of states in the world's history, was convened to draft a treaty of peace concluding the European War of 1914-19. Active hostilities had been suspended in 1918 under the terms of armistices concluded with Bulgaria on Sept. 29, with Turkey on Oct. 31, with Austria-Hungary on Nov. 4, and with Germany on Nov. 11. Preliminary arrangements for the Conference were made by the Interallied Council at Versailles, which also drew up the armistice terms. A notable departure from ordinary practice was that representation was confined to the victorious Powers. German, and later, Austrian, representatives were summoned at a late stage in the proceedings, and then only to be handed virtually completed treaties.

Aside from formally setting the machinery of the Conference into operation, the plenary sessions had little to do beyond giving formal approval to the completed treaties. In fact, up to the time when the completed draft of the treaty with Germany was handed to the delegates of that country on May 7, only four plenary sessions had been held. The actual direction and control of the policies of the Conference were in the hands of the representatives of the Great Powers, who had ruled that they alone were privileged to attend all of the sessions of the Conference. The Council of Four assumed general direction of the work and policies of the Conference. The reports of most of the commissions were brought before it for scrutiny and review.

Efforts were centered, in the first place, on the completion of the German treaty, although Italy would have preferred that work on the German and Austrian treaties should proceed *pari passu*. The Austrian treaty, except for its territorial dispositions, was in large part a modification of the German treaty to fit the different circumstances of the Austrian situation. Although during the early weeks the subject given most consideration was the Covenant of the League of Nations (the first draft of which was presented to the plenary session on Feb. 14), that subject did not absorb all of the energies of the Conference. But with the League of Nations once agreed upon, the rest of the work of the Conference was greatly facilitated. On May 7, at Versailles, the German treaty was handed to a delegation headed by Count von Brockdorff-Rantzau, representing the new German government. Opportunity was given the German delegates to file written memoranda of criticism, together with counter-proposals, but the changes finally agreed to by the Allied Powers were slight. The treaty was signed on June 28, 1919, in the Hall of Mirrors of the Palace of Versailles. A brief summary of the principal provisions of the treaty follows:

I.—*Covenant of the League of Nations.*—All of the Allied and Associated States signing the treaty are to be members, and Persia and the neutral countries of Europe and South America are invited to accede to the Covenant. The membership may later be increased. The League, which has its seat at Geneva, operates through, first, a periodical *Assembly*; second, a *Council*; third, a permanent *Secretariat*. (For a detailed discussion of this subject, see LEAGUE OF NATIONS.)

II. and III.—*Boundaries of Germany and*

*Political Clauses for Europe.*—Alsace-Lorraine is returned to France, and the ownership of the coal mines of the Saar Basin is vested in the French State. The government of the territory of the Saar Basin is intrusted for fifteen years to a Commission representing the League of Nations. At the end of that period there is to be a plebiscite on the alternatives of union with France, union with Germany, or maintenance of the commission régime. To Poland Germany cedes nearly all of the Province of Posen and nearly all of West Prussia w. of the Vistula.

IV.—*German Rights and Interests Outside Germany.*—Germany gives up her colonies and renounces all extra-territorial rights which she enjoyed as against the Allied and Associated Powers.

V.—*Military, Naval, and Aerial Clauses.*—The German Army is limited to 100,000 men and officers, and the civilian administrative personnel is correspondingly reduced. German naval forces are limited to 6 battleships, 6 light cruisers, 12 destroyers, and 12 torpedo boats. The construction or acquisition of submarines is forbidden. The personnel of the Navy is not to exceed 15,000. Germany may maintain no air forces.

VIII.—*Reparation.*—Compensation may be claimed from Germany for injuries to civilians through acts of war or maltreatment; for the maltreatment of prisoners of war; for the cost of military and naval pensions, of assistance to prisoners of war and their dependents, and of separation allowances; for forced labor without just compensation; for the destruction, injury, or seizure of non-military property; for fines and similar exactions imposed upon civilians. Germany's specific undertaking is to pay 20,000,000,000 gold marks within two years, followed by 1,000,000,000 marks per year for five years, and then by 2,400,000,000 marks per year, of which 2,000,000,000 is regarded as interest on a principal sum of 40,000,000,000 marks, the balance being credited towards amortization.

X.—*Economic Clauses.*—Germany agrees not to discriminate against the nationals of the Allied and Associated States, or against their trade or shipping. Whether these provisions, which are non-reciprocal, are to remain in force for more than five years is to be determined by the Council of the League of Nations.

XII.—*Ports, Waterways, and Railways.*—The Elbe, the Oder, the Niemen, and the Upper Danube (from Ulm) are internation-

alized and placed under the control of international commissions. The Rhine is to be controlled by a commission composed of five representatives of France, four of Germany, and two of each of the other riparian States, Great Britain, and of Italy. All water rights on the Rhine opposite the French frontier are assigned to France. The Kiel Canal is to be open on equal terms to the trade of all nations at peace with Germany.

**XIII.—Labor.**—Associated with the League of Nations there are to be an International Labor Conference, meeting at least once a year, and at which Governments, employers and workers are to be represented, and a permanent International Labor Office.

**XIV.—Guarantees.**—German territory w. of the Rhine is to be occupied by Allied and Associated troops for at least fifteen years; withdrawals by stages, beginning at the Rhine bridgeheads, at the end of each five-year period, being conditional on Germany's performance of all her obligations under the treaty.

**Peace Convention.** After the election of President Lincoln and the secession of the Southern States, an attempt at compromise was made at a convention, known as the *Peace Convention*, held in Washington, D. C. (February 4 to 27, 1861). Its sessions were secret, but its chief proposals soon became public. The North, however, felt that the right of property in slaves was still recognized, and the proposals were rejected.

**Peace of God**, an attempt, by the Church of France, in the latter part of the tenth century, by the infliction of spiritual penalties, to put an end to the private warfare between the nobles, and compel them to adjust their differences in the civil courts. It proved a failure, and a compromise known as God's Truce was substituted.

**Peace Pact of Paris.**—On August 27, 1928, representatives of fifteen States met in Paris and signed a treaty providing for the renunciation of war as an instrument of national policy. Such a treaty was first suggested by M. Briand, Foreign Minister of France, to Mr. Kellogg, American Secretary of State, in April, 1927. By December 1, 1928, about sixty States had either signed the treaty or signified their intention to adhere. It was ratified by the U. S. Senate Jan. 15, 1929. The first article of the Anti-War Pact is as follows:

The High Contracting Parties solemnly declare in the names of their respective peoples that they condemn recourse to war for the

solution of international controversies, and renounce it as an instrument of national policy in their relations with one another. As a result of negotiations, the leading parties to the pact made it clear that the renunciation of war as an instrument of national policy does not apply to war in the following cases:

1. In self-defense.
2. Against any State which breaks the treaty.
3. In execution of obligations under the League Covenant.
4. In execution of obligations under the Locarno agreements.
5. In execution of obligations under treaties guaranteeing neutrality, which presumably include the French alliances.

Article 2 of the Anti-War Pact provides: 'The High Contracting Parties agree that the settlement or solution of all disputes or conflicts of whatever nature or of whatever origin they may be, which may arise between them, shall never be sought except by pacific means.' This article is more sweeping in extent than Article 1, and may be interpreted to prohibit the use of all forms of force between States. If the purpose of this article is to be realized, the establishment of machinery for the settlement of disputes seems necessary. It is also important to consummate agreements, whether through periodic conferences or otherwise, which will remove the causes of disputes. Thus agreements in regard to armaments and economic matters would seem essential.

On July 24, 1929, with impressive ceremony, the pact was formally proclaimed in force by U. S. President Hoover at Washington, D. C., in the presence of a distinguished company of diplomats and representatives of forty-three nations. The most important result of the Anti-War Pact was believed to be moral or psychological. If the Pact had been taken seriously, governments would have thought in terms of peace rather than of war. It was intended that the pact would be a weapon in forming public opinion. However, the subsequent growth of dictatorships with complete control of the press and speech made dictators immune to public opinion.

**Peace River**, a river of Western Canada forming one of the main tributaries of Mackenzie River. The combined Peace and Slave Rivers are navigable with only two interruptions from Fort St. John, just e. of the front range of the Rocky Mountains, to Great Slave Lake, a distance of 1,200 m.

**Peace River District**, a term applied to the territory adjacent to Peace River. Although agriculture is the principal potential asset of the district, others are not wanting. Extensive coal fields exist on the Upper Peace and its tributaries. Placer gold occurs in the mountain streams tributary to Peace River, and extensive gypsum deposits are exposed in the river valley below Vermilion Falls. Dominion government reports give over 8,000,000,000 board feet of merchantable timber as a conservative estimate of the timber wealth of the district.

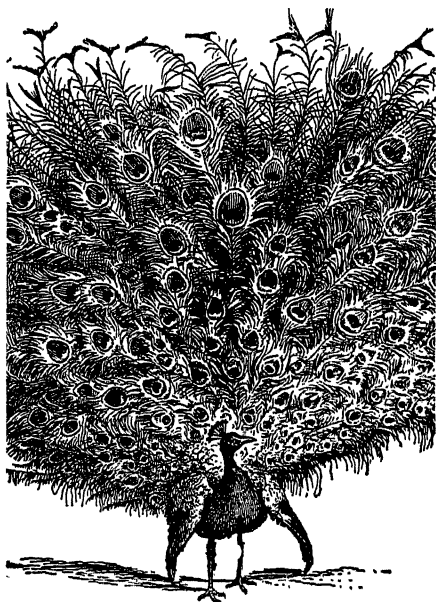
**Peace Treaty (1919)**. See **Peace Conference of Paris**.

**Peach**, a stone fruit, native to China, which has been cultivated from the earliest times, reaching Europe by way of Persia; hence its specific name, *Prunus persica*. It is widely grown in the United States, standing next to the apple in acreage and yield of fruit. The ideal climate for the peach is one of an equable winter temperature, seldom below zero, and without prolonged warm periods alternating with the cold. Peaches of the highest color and best eating and commercial qualities are produced on sand, sandy loam soil, or well drained gravelly or stony loams. The most serious insect enemies of the peach, in order of importance, are the borer, the San José scale, and the curculio. The diseases of the peach most difficult to combat are the yellows, the little peach, and the rosette. Neither the causes nor the modes of infection of these diseases are yet known. The production of peaches in the United States amounts to about 53,286,000 bushels annually. Peaches are grown principally in Georgia, Delaware, Maryland, Virginia, Pennsylvania, and New Jersey. Peach canning is an important industry.

**Peach Tree Creek, Battle of**, a conflict in the American Civil War, fought near Decatur, Ga., about 6 m. n. of Atlanta, on July 20, 1864, between a part of the Federal army commanded by W. T. Sherman, and a part of the Confederate forces under J. B. Hood. The Confederates were defeated which hastened the fall of Atlanta.

**Peacock**, or **Peafowl** (*Pavo cristatus*), a species of a small genus of game birds belonging to the family Phasianidæ, or pheasants. The peacock is a native of hill-forest regions in India and Ceylon, where it is found in large numbers in a wild state. It is a large, handsome bird with gorgeous colorings. Like most of its allies, the peafowl is polygamous, the display of the male before his mates being a

common sight in captivity. Peacocks are held sacred by various Indian castes, and in the native states are carefully protected. The birds were introduced into Europe at an early period, and in former ages were regarded as a delicacy for the table. They are now bred almost wholly to furnish an ornament to



Peacock.

parks or large estates, for in confined quarters they become a nuisance through their harsh screaming and their destructiveness.

**Peacock, Thomas Love** (1785-1866), English poet and novelist, was born in Weymouth. He was an intimate of Shelley. One of his daughters married George Meredith. His chief works of fiction are *Headlong Hall* (1816); *Nightmare Abbey* (1818); *Maid Marian* (1822); *Misfortunes of Elphin* (1829); and *Crotchet Castle* (1831).

**Peale, Charles Wilson** (1741-1827), American painter, was born in Chestertown, Md. He studied art under Copley in Boston (1768-9), went to London (1770), where he became a pupil of Benjamin West, returned to Annapolis in 1774 and was there occupied as a portrait painter until 1776, when he removed to Philadelphia. He painted a large number of portraits of Washington. Among other portraits are those of Martha Washington, Baron Steuben, Benjamin Franklin, John Hancock, Thomas Jefferson, Alexander Hamilton, James



Monroe, John Quincy Adams, and Andrew Jackson.

**Peale, Rembrandt** (1778-1860), American painter, son of C. W. Peale, was born in Bucks co., Pa. In 1820 he painted his best-known picture, *The Court of Death*, which he exhibited throughout the country. Two years afterward he painted the last of several portraits

*Arachis hypogæa*, often called ground-nut or earth-nut. The peanut is generally regarded as a native of Brazil, but is now cultivated in all warm regions of the world, especially in Africa, India, China, the East Indies, and in the tropical and subtropical parts of America. It is grown as a market crop with peanut hay as a by-product and as a special forage crop.



Photo from Ewing Galloway, N. Y.

#### *The Pearl Industry.*

Pearl Divers at Ceylon awaiting the signal to dive. Two ropes controlled on board are let down. A stone or metal sinker is attached to one and a net basket to the other. The diver descends with one foot on the rope and the basket in his hand. When the basket is filled, he gives the signal, and the rope is pulled to the surface.

of Washington, which was bought by Congress in 1832. Among his paintings are *Napo-*



Pear  
1. Flower section. 2. Fruit.

*leon on Horseback; Song of the Shirt; Roman Daughter; Ascent of Elijah.*

**Peanut**, the seed of the leguminous plant,

Peanut oil is used in large quantities for making margarines and soaps and as a salad oil, while peanut meal has a high value as feed for animals. Other uses for peanuts are in the making of salted peanuts and peanut butter.

**Pear**, an orchard fruit widely grown in all temperate regions. The various cultivated varieties are derived from two sources, the European pear (*Pyrus communis*) and the Oriental pear (*P. sinensis*). The leading commercial varieties are Bartlett and Kieffer. The Seckel is a prominent Eastern variety of excellent quality. Pears are third in importance in orchard fruits in the United States. The production is about 25,703,000 bushels annually.

**Pearce, Charles Sprague** (1851-1914), American painter, was born in Boston, Mass. His paintings of Egyptian scenes and of figures in old costumes include *Death of the First-Born of Egypt* (1877), *The Water-Carrier* (1883), and *Une bergère* (1886). Mr. Pearce was one of the decorators of the Library of Congress at Washington. He was a member of the National Institute of Arts and Letters.

**Pea Ridge, Battle of**, a battle of the Civil

War fought in the n.w. corner of Arkansas. To the Confederates the engagement was known as the Battle of Elkhorn. It was the first Federal victory west of the Mississippi, and saved Missouri to the Union cause.

**Pearl**, an abnormal product formed, because of some irregularity, in the tissues of certain shellfish, highly valued as a gem. It consists of a number of layers of organic and inorganic matter arranged more or less regularly around some common center, called the nucleus, and resembling in structure certain layers of the shell of the mollusc in which it has been formed. Its characteristic lustre is due to reflection of light from the different levels on the surface. True pearls are of two kinds, cyst pearls and muscle pearls. Cyst pearls are the more important commercially. Nearly all molluscs produce pearls, but in only two families do they occur in sufficient quantities and with sufficient constancy to be commercially important. These two families are the *Margaritifera*, to which belongs the Ceylon pearl oyster (*Margaritifera vulgaris*), the greatest of all pearl producers, and the *Unionidae*, to which belong the fresh-water molluscs of America, China, Scotland and other countries. The most important pearl fisheries are those of Ceylon, the Persian Gulf, Venezuela, Japan, the Red Sea, and Australia. Artificial pearls are manufactured from globules of glass treated with a special mixture made from fish scales; they are also made of spherical pieces cut from mother-of-pearl shell. They have considerable commercial value, and there is a great demand for them in many countries.

**Pearlashes**, a refined form of the crude potashes obtained from wood ash, and consisting chiefly of potassium carbonate,  $K_2CO_3$ .

**Pearl Harbor**, a port on the s. of Oahu, Hawaiian Islands, 6 m. w. of Honolulu. Pearl Harbor is the United States' greatest naval station and represents an expenditure of \$20,000,000. Dec. 7, 1941 Japan launched a surprise attack on Pearl Harbor.

**Pearl River**, a river of Mississippi, which forms part of the boundary between that State and Louisiana. The river is about 300 miles in length, but shoal water renders navigation difficult.

**Peary, Robert Edwin** (1856-1920), American Arctic explorer and rear-admiral of the U. S. Navy, was born in Cresson, Pa. His early achievements in Arctic exploration he summarized in his *Northward Over the Great Ice* (1898). Peary's next voyage covered four years (1898-1902), during which he deter-

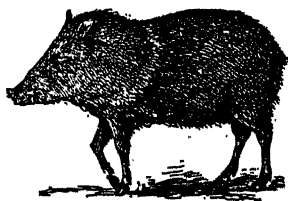
mined the northern limit of the Greenland archipelago, or land group, and practically connected the coast s.e. to Independence Bay. In the summer of 1905 he again set forth, by way of Greenland or Grant Land, for the North Pole, in the *Roosevelt*. In the summer of 1908 the *Roosevelt* carried another expedition as far north as Cape Sheridan. From that point Peary and five other white men, a negro, and 17 Eskimos with 19 sledges and 133 dogs, began their journey over the ice (Feb. 28, 1909). Through a combination of foresight, endurance, and good fortune, Peary attained his goal and on April 6, 1909, hoisted the American flag at the Pole. Consult his *The North Pole* (1910), and *Secrets of Polar Travel* (1917).

**Peasants' Proprietor**. See **Land**.

**Peasants' War**, an insurrection beginning in 1524, when peasants in the Black Forest rose against the nobles, and spreading, during the rest of that year and the early months of 1525, throughout the south of Germany. The demands of the peasants were formulated in 12 articles, which included the reduction of villein service, the right of electing their own ministers, liberty to fish and kill wild game, and the restoration of communal lands.

**Peat**, an accumulation of more or less spongy, decaying vegetable matter, generally occurring over the large areas in the temperate regions of the globe. Peat is intermediate in character between recent vegetable material and coal. It is estimated that more than 11,000 sq. m. of swamp land in the United States contain peat beds of good quality. Peat has been used extensively in Northern Europe as fuel. In America peat has found its chief application as a fertilizer.

**Pecan**, (*Hicoria pecan*), a North American nutbearing tree belonging in the same genus as the hickory.



*Collared Peccary.*

**Peccary**, the native pig of the New World. There are two species, both comparatively small animals, the larger not exceeding 40 inches in length. In several respects the peccaries are more highly specialized than the

true pigs. The collared peccary extends from Arkansas to Patagonia, occurring singly, in pairs, or in small family parties not exceeding ten.

**Peck**, a dry measure of capacity, equal to eight quarts, or a quarter of a bushel. The British peck has a capacity of 554.548 cu. in.; the American, 537.6 cu. in.

**Peck, Annie Smith** (1850-1935), American archaeologist, educator, and mountain climber, born Providence, R. I. She ascended the Matterhorn in 1895, Popocatepetl and Orizaba in 1897, and Funfingerspitze in the Tyrol in 1900; and made new records of ascent at Mount Sorata in Bolivia (20,500 ft.) in 1904, and at Mount Huascaran in Peru (one of the highest peaks in the Western Hemisphere), where, after several attempts, she reached the summit (over 22,000 ft.) on Sept. 2, 1908.

**Peck, Harry Thurston** (1856-1914), American educator and author, born in Stamford, Conn. In 1895 he became editor of *The Bookman*, and from 1897 to 1901 was literary editor of the New York *Commercial Advertiser*. He was joint editor of *The New International Encyclopædia*. Other works edited by him are *A Dictionary of Classical Literature and Antiquities* (1895), and *Masterpieces of Literature* (1899).

**Peck, Jesse Truesdell** (1811-83), American Methodist Episcopal bishop, brother of George Peck. He was one of the founders of Syracuse University. He was elected a bishop of the Methodist Episcopal Church in 1872.

**Peck, John James** (1821-78), American soldier, was born in Manlius, N. Y. In November, 1864, was put in command on the Canadian frontier. In 1866 he organized the New York State Life Insurance Company, of which he was president until his death.

**Peck, Samuel Minturn** (1854-1938), Amer. author, born in Tuscaloosa, Ala. He has written many popular songs, of which the best-known are 'Grape Vine Swing,' and 'The Knot of Blue.' His publications include: *Alabama Sketches* (1902); *Maybloom and Myrtle* (1910).

**Peckham, Rufus William** (1838-1909), American jurist, was born in Albany, N. Y. In 1869 he was appointed district attorney of Albany co., N. Y.; was corporation counsel of the city of Albany in 1880-1; and was a justice of the Supreme Court of the State of New York from 1883 to 1886, when he became associate justice of the Court of Appeals. In this capacity he showed distinguished ability, which caused his appointment by President

Cleveland as Associate Justice of the United States Supreme Court (1895).

**Pecora, Ferdinand** (1882- ), lawyer, was born in Nicosia, Italy. He has been practicing law in New York since 1911. He was appointed counsel to the United States Senate Committee on Banking and Currency, and during 1933-34 conducted investigations into stock market security selling and related practices; early in 1935 was appointed as a justice of the Supreme Court of New York State.

**Pecos River**, New Mexico and Texas, rises in the Sangre de Cristo Mountains in New Mexico, not far from Santa Fé. Irrigating reservoirs have been built near Carlsbad, N. M. The river flows mostly through desert country.

**Pecten**, a genus of lamellibranch molluscs, try, and carries little water. Length, 800 miles. known as scallops. The animal has a beautiful fringed mantle, bearing numerous simple eyes.

**Pectin, Pectic Acid**, complex, jelly-like compounds, allied to the carbohydrates, and obtained from juice of unripe fruits and roots, such as pears or carrots.

**Pedagogy** is the science of education, or the art of teaching; or, more practically, the study of the principles derived from various sciences and other embodiments of human experience which bear on effective education. The names of Comenius, Rousseau, Pestalozzi, Froebel, Herbart, Spencer, Parker, Hall, and Dewey carry with them the suggestion of the ideals for which, at successive periods in educational development, they have stood. The great educational ideals, so stimulating to the student of education, have made comparatively slow progress. There is observable an increasing tendency for educators, often on the basis of the above theories, to develop educational experiments and tests in order to find whether a given procedure does produce most effective and economical results in the direction of a pre-determined aim. It can hardly be doubted that as education becomes more of a science this method will be increasingly followed. The larger pedagogic theories will be regarded as suggestive, but not final. Both faith and resources for the experimental advance of pedagogy are still wanting, but the progress of the last few decades indicates that both will be available at no distant date.

The aims of modern education have been affected by the slowly elaborated belief that the most effective preparation for life consists in giving the child, at any stage of his growth, the fullest possible self-realization at that period—self-realization, not only individually,

but socially as well. This, it will be observed, is the doctrine of self-activity stated with reference to educational aims. Under the influence of this doctrine curricula and methods are being slowly modified. Those studies and phases of studies which possessed only significance for adults, and were, therefore, without vitality or interest for the child, are being eliminated, to be replaced by exercises and activities which beget vital response from the child. The changes in educational theory in this direction in recent years are quite fundamental, but educational practice clings, and must cling, to traditional ways until better ways have been worked out in some detail. Scientific pedagogy is today addressing itself no less to the task of finding out ways and means than to its older task of elaborating theory. It is passing from the stage of speculation to that of experimentation. References: Bagley, *The Educative Process*; De Garmo, *Interest*; Dewey, *School and Society*; Froebel, *Education of Man*; Hall, *Adolescence*; Hanus, *Educational Aims and Educational Values*; Harris, *Psychologic Foundations of Education*; James, *Talks to Teachers*; Judd, *Genetic Psychology for Teachers*; Kirkpatrick, *Fundamentals of Child Study*; McMurry, *General Methods*; O'Shea, *Dynamic Factors in Education* (New York, 1906); Rosenkranz, *Philosophy of Education*; Spencer, *Education*; Thorndike, *Principles of Teaching* (New York, 1906); Tarde, *Imitation* (trans. New York, 1906).

**Pedicellariæ**, curious pincer-like structures found on the surface of the body in some echinoderms.

**Pedicularis**, a genus of hardy herbaceous plants belonging to the order Scrophulariaceæ.

**Pedigree**. Ancestral pride, strong in new countries, forms a cult (Shintoism) in old Japan. The Jew sought his origin in Abraham, the Greek in Hellen or Zeus, the Roman in Æneas. To find his name in Domesday Book, to have come over with or before the Conqueror, delights the Englishman, as to figure among the *Mayflower* men, or in some early 'Licence to pass beyond Seas,' delights the American; and the Celt glories in his royal O' or Mac, as the Roman noble did in his *stemmata gentilitia*.

**Pediment**, the low triangular part rising above the portico of Greek buildings.

**Pedometer**, an instrument for measuring distances traversed in walking.

**Pedro I.** (1334-69), king of Castile and León, commonly surnamed 'the Cruel,' the only legitimate son of Alphonso XI., was born

in Burgos, and succeeded to the throne in 1350. In 1353, at the instigation of his mistress, afterwards his queen, Maria de Padilla, he took the reins of government into his own hands. From that time until his death his reign was one long struggle to overthrow the power of the great vassals and to establish a strong government.

**Pedro I., de Alcantara** (1798-1834), emperor of Brazil, son of John VI. of Portugal, was born at Queluz, near Lisbon. On his father's return to Portugal from Brazil, whither the royal family had fled in 1807, Pedro was made regent of the latter country (1821) and threw in his lot with the separatist party. He was proclaimed emperor in 1822; and in 1825 the independence of Brazil was formally acknowledged.

**Pedro II., de Ancantara** (1825-91), emperor of Brazil, was born in Rio de Janeiro, and proclaimed emperor in April, 1831, on the abdication of his father. An army revolution in 1889 forced him to abdicate.

**Peebleshire, or Tweeddale**, inland co., Scotland, s. of Edinburghshire. Area 348 sq.m. The antiquities include over 50 hill-forts, the 'Romanno terraces,' a Roman camp at Lyne, the ruined castles of Neidpath and Drochil, and the old mansion of Traquair; p. 15,050.

**Peekskill**, village, New York, Westchester co., on the e. bank of the Hudson River, and 40 m. n. of New York City. Peekskill is a residential and manufacturing place, with an output of hollow ware, blank books, fire bricks, hats, stoves, foundry and machine-shop products, underwear, boilers, vinegar, and yeast. The training camp of the New York National Guard is located here; p. 17,311.

**Peel, Sir Robert** (1788-1850), British statesman, was born near Bury, Lancashire, and was at Harrow with Lord Byron. From 1828 to 1830 he was Home Secretary in the Duke of Wellington's cabinet. The question of Catholic Emancipation was at this time one of the prime issues to be met. Though at first opposed to the idea of emancipation, Peel was driven to the view that, for the peace of Ireland, the demands of O'Connell would have to be granted. He carried the day against the prejudices of the king, and in 1829 the great measure of liberation was passed. In this year, also, Peel created the metropolitan police force, the nickname 'bobby' being taken from his Christian name. Peel was Prime Minister from Dec. 9, 1834, to April 8, 1835, and again from 1841 until 1846. Peel's action in repealing the Corn Laws was a logical development

of the attitude he was compelled to take up as a financial minister. When he abolished the Corn Laws, Peel laid down two great principles for the future guidance of British finance ministers—taxation for revenue purposes only, and not for maintaining monopolies, and the levying of taxes in such a way as not to impede the growth of any particular industry. Two things drove him to accept repeal in place of moderate reform of the Corn Laws—the distress in the country, and the profound impression made by Mr. Cobden and Mr. Bright, backed by the Anti-Corn-Law League. Repeal was carried by a majority of 97. Peel next turned his attention to Ireland. He brought in a Coercion Bill. His old friends

*Battle of Alcazar* (1594); *Old Wives' Tale* (1595); *David and Bethsabe* (1599).

**Peer, Peerage**, the appellation given to the titled nobility of Great Britain. British nobility includes two classes: the 'lower,' to which knights, baronets, and even younger children of peers belong; and the 'higher' nobility, consisting of the peerages of England and Scotland, Ireland, Great Britain, and the United Kingdom. Each series is made up of five degrees: Duke, Marquis, Earl, Viscount, and Baron. These degrees differ in rank but not in privileges. Baron is the lowest order and is much more usual than the others. At the present time most of the Dukes are princes of the royal blood. The British peerage con-

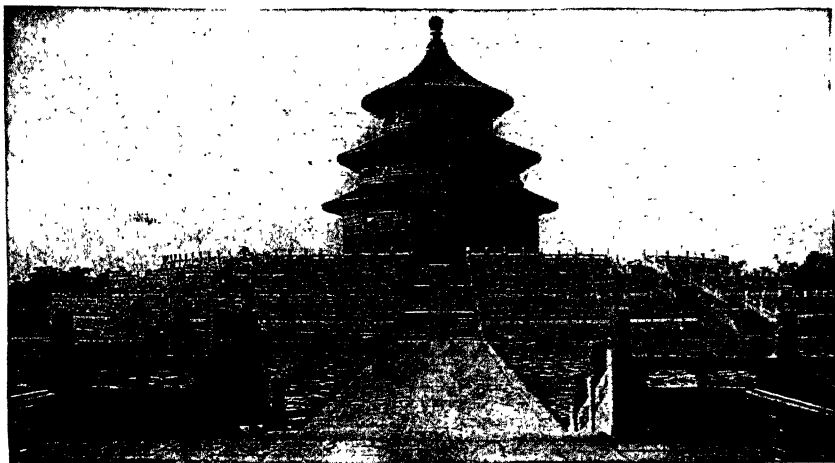


Photo by De Cou, from Ewing Galloway, N. Y.

*Peiping: The Temple of Heaven where the Emperors annually offered prayer and sacrifice.*

the Protectionists, headed by Lord George Bentinck, took their revenge, and Peel's bill was defeated by 73 votes. He thereupon tendered his resignation. Though out of office, Peel continued to play an important part in the affairs of the nation. Peel's greatest praise is that by wise concessions to the time spirit he enabled England to escape a period of political revolution.

**Peele, George** (c. 1558-c. 1597), English dramatist, was the son of a clerk of Christ's Hospital, London. He wrote plays, composed complimentary poems for his patrons, and pageants for ceremonial occasions, such as the Lord Mayor's show. He was probably a player as well as a playwright. His plays are: *Arraignement of Paris* (1584); *Edward I.* (1593);

sists historically of 'all the members, or possible members, of the House of Lords, and no other persons' (Freeman). Originally, the spiritual lords were included in this definition. Since the 17th century, however, they have not been considered peers. During the 19th century, also, some titles of nobility were conferred for life, the recipients of which were held to be not members of the House of Lords, while lords of Parliament were created who are barons for life and are entitled to a writ of summons while in office. But the term peerage, as strictly interpreted, includes only the temporal hereditary peerage. Peerage cannot be relinquished nor forfeited except by attainder or act of Parliament. A peeress in her own right possesses all the privileges of

a peer, except a seat in Parliament. A widow or wife of a peer is also privileged, but on marriage with a commoner loses the right of trial by the Upper House. Morganatic marriage legitimizes offspring, but gives no claim to the father's rank or property. The title 'lord' is extended by right or courtesy to most members of the peerage, and to their children (with exceptions); also to bishops of the Church of England and colonial bishops, but not, as an undisputed right, to bishops suffragan, missionary, or Scottish or Irish prelates. The daughters of earls, dukes, and marquises are entitled to be called 'Lady.' The younger sons of earls and all younger children of viscounts and barons may use 'Honourable' before one of their Christian names.

**Pegasus**, in ancient Greek legend, was a horse with wings which sprang from the blood of the Gorgon Medusa when Perseus cut off her head. Bellerophon caught him while drinking at the fountain of Pirene, on the Acrocorinthus. Mounted on Pegasus, Bellerophon killed the Chimæra. Later Bellerophon tried to ascend to heaven, but fell to earth; while Pegasus continued his ascent, and was placed among the stars.

**Pegasus**, an ancient Greek constellation lying between Andromeda and the head of Aquarius.

**Pegmatite**, a term used for extremely coarse-grained granites, especially those occurring in veins.

**Pehlevi**, or **Pahlavi**, a language of the Parsees, or Parsis, which, flourishing between the third and the ninth century, came between Zend and modern Persian, and bears considerable resemblance to the latter.

**Peiping**, the new name of **Peking**, former capital of China. In 1928 the Nationalists, the ruling party of China under Gen. Chiang Kaishek renamed the city. See **PEKING**.

**Peirce, Benjamin** (1809-80), American mathematician and astronomer, was born in Salem, Mass. He stimulated public interest in astronomy and led to the foundation and equipment of Harvard Observatory. During 1852-67 he supervised the longitude determinations of the U. S. Coast Survey, and from 1867 to 1874 was superintendent of the survey. *Analytic Mechanics* (1855-7) was the first great mathematical work produced in the United States.

**Peirce, Charles S.** (1839-1914), philosopher, son of Benjamin Peirce, the mathematician, developed the philosophical concept of pragmatism which, to distinguish it

from William James's similar theory, he later called pragmatism. Peirce's philosophy has become of increasing importance and influenced the thought of John Dewey and the behaviorists twenty years after his death. Peirce lectured at Johns Hopkins, Harvard and the Lowell Institute.

**Pekin**, city, Illinois, county seat of Tazewell co. It is situated in a productive agricultural district, and there are bituminous coal deposits in the vicinity; p. 19,407.

**Peking** (now **Peiping**), ('Northern Capital'), city, former capital of the Republic of China, in the province of Chili; 80 m. w. of Tientsin, with which it is connected by rail. It is situated on a flat, sandy plain, is surrounded by high walls, and covers an area of about 20 square miles. The climate is generally dry and bracing, though there are from 6 to 8 weeks of extremely hot weather in the summer. Periodical dust storms of considerable violence occur. Peiping consists of two distinct parts, the northern or Tartar city, and the southern or Chinese city. In the center of the Tartar city, occupying about two square miles, is the Imperial City shut off by a wall 20 ft. high, within which were the residences of the princes and high Manchu officials of the old régime. Within the Imperial City, also surrounded by walls, is the Forbidden City, which, until after the Boxer rebellion, no foreigner was allowed to enter. Here were the palaces, royal residences, and gardens. South and a little to the east of the Forbidden City, is the legation quarter, which was the scene of fierce fighting during the Boxer rebellion. The southern or Chinese city is rectangular in shape, projecting beyond the Tartar city on either side. Large portions of this city are unoccupied, but it contains the greater part of the population and most of the business is carried on here. Its chief features of interest are the Temple of Heaven, where semi-annually the emperor was wont to offer prayer and sacrifice amidst the most imposing ceremonies. Porcelains, embroideries, Tibetan and Mongolian brass, carpets, rugs, and jewels are among the articles for which it is celebrated. The Japanese seized the city in 1937 and continue to occupy it; p. 1,556,000.

**Peking, University of**, an institution of higher learning in Peking, China, founded by Imperial Edict in 1897. After a somewhat precarious career it was reorganized in 1916.

**Pelagic Animals**, those which inhabit the open sea. They are contrasted, on the one hand, with those which live on the sea bot-

tom in shallow water (littoral or shore animals); and, on the other, with those which live in great depths (abyssal animals).

**Pelagius**, a heresiarch of the 4th or 5th century, was apparently of Gaelic origin. Little is known of the details of his early life, but tradition says that his real name was Morgan or Marigena ('sea-born'), of which Pelagius is a Greek translation. He resided at Rome for some years with an Irish monk, Coelestius, was condemned by Pope Zosimus, and banished by the Emperor Honorius in 418.

**Pelargonium**, a genus of herbaceous and shrubby plants belonging to the order Geraniales. They are mostly natives of South Africa and are usually called geraniums. The zonal type is exceedingly popular in America, owing to the ease with which it can be cultivated and the brilliance of its coloring. All the pelargoniums are of comparatively easy culture, liking a light, sandy, well-drained soil containing a little cow manure and leaf-mould. They do not require much pot-room, and should not be over-supplied with water, especially in winter, but must have an abundance of air. By skilfully regulating the temperature and the water supply, and by judicious pinching out of buds, pelargoniums may be had in flower at any time of the year.

**Pelagians**, the primitive population of ancient Greece, in whole or in part.

**Pelée, Mont**, volcano in the northwestern part of Martinique, West Indies. In April 1902, warnings of impending activity were seen and heard in the island, and on May 8 a terrific explosion occurred, almost completely destroying the town of St. Pierre with its entire population. On August 30 of the same year another eruption destroyed Morne Rouge and other villages.

**Peleus**, in ancient Greek legend the king of the Myrmidons in Thessaly. He married the goddess Thetis; Achilles was their only child.

**Pelew Islands**, the westernmost group of Micronesia, less than 550 m. e. of the Philippines. They were formerly included in the German New Guinea Protectorate, but under the Treaty of Versailles came under Japanese mandate; p. 7,257.

**Pelias**, in ancient Greek legend, a son of the god Poseidon, twin brother of Neleus. The two seized the kingdom of Iolcos who had married Tyro, their mother, excluding her son, Aeson. When Jason, Aeson's son, came to claim his father's kingdom, Pelias sent him in quest of the golden fleece. On Jason's return with Medea, she induced the daughters of

Pelias to cut their father in pieces and boil him, in the hope of restoring him to youth: in this way she secured vengeance for Jason.

**Pelican**, a genus of stork-like birds, whose members resemble the cormorants, gannets, and their allies in having all four toes turned forward and united by a web—a type of foot which is described as steganopodous ('sheathed foot'). The pelicans have short legs, rough plumage, and an enormously developed bill, from which hangs a large dilatable pouch. The



*Pelican.*

food consists almost entirely of fish, which are temporarily stored in the pouch, and later swallowed at leisure. This has apparently given rise to the myth that the mother feeds the young with blood from her own breast, and to the religious symbolism represented by the 'pelican and its piety.' Two or three species occur in the United States, the largest being the white pelican.

**Pelican Fish** (*Eurypharynx pelecanoides*), a fish inhabiting the oceanic abysses and first obtained off the w. coast of Africa at a depth of nearly 10,000 ft. The head is large and the gape enormous, the body tapering and flat, fringed above and below with spinous rays.

**Pelion**, a range of mountains in Thessaly (the modern name of whose chief summit, 5,308 ft., is Plessidi).

**Pellagra**, an endemic skin and spinal disease characterized by recurring erythema of the surface of the body which is followed by exfoliation of the epidermis, and marked by gastro-intestinal disturbances, spinal pain and symptoms of nervous disorders. Many theories as to its cause have been put forward in the past. The one belief that has continued to survive, and with increasing substantiation, is that there is a casual relationship between the disease and the dietary of the patient. The most fruitful recent investigations have been

those of the United States Public Health Service in institutions of the southern United States, conducted chiefly by Goldberger and his associates. The most striking facts brought out by these studies were the relationship of the disease to poverty, and the disproportionately large cereal element and disproportionately small protein element in the dietary. The prevalence of pellagra in the recent Mississippi flood area appears to be dependent upon the dietary habits of the people; the tenant farm system of cotton production; the availability of various essential foods, which, in turn, is directly influenced by the one-crop type of agriculture. The tenants in the cotton-producing area appear to have as their chief articles of diet, fat salt pork, cornmeal, and molasses; wheat flour, rice, and dried beans are used to some extent, while limited quantities of milk, poultry, eggs, and vegetables are even more restricted in periods of unfavorable economic conditions.

**Pelopidas**, a native of Thebes in ancient Greece, the deliverer (379 B.C.) of his city from the Spartan domination.

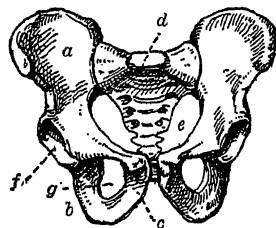
**Peloponnesus**, 'the island of Pelops'—that is, the southern part of Greece, joined to the mainland by the isthmus of Corinth. Down to the 7th century B.C. Argos was the leading state; from that time until about 300 B.C. Sparta took its place; afterwards, until the Roman conquest in 146 B.C.

**Pelops**, in ancient Greek legend, the son of Tantalus, king of Phrygia, and a grandson of Zeus. When he was a child his father is said to have invited the gods to a banquet, and to have killed Pelops, and set his flesh before them to eat; but at the command of Zeus Hermes restored Pelops to life.

**Pelota**, the Spanish national ball game. It is not unlike handball, but played in a court with a four-ounce solid rubber ball, and the cestus, a sort of basket-work gauntlet, worn on the player's forearm.

**Pelvis**, in the human skeleton, a bony girdle supporting the spinal column and resting upon the lower extremities. The bones forming it are the sacrum and the coccyx at the back and in the middle line, and an os innominatum or hip bone on each side and in front. Although fused and unified in the adult, the hip bone in early life consists of the ilium, the ischium, and the pubis, each of which has a share in forming the acetabulum, or cup-shaped cavity for the reception of the rounded head of the femur or thigh bone. The bony strength also serves

to protect the delicate organs (bladder, uterus, rectum) which lie in the cavity of the true pelvis.



*The Pelvis.*

*a*, ilium; *b*, ischium; *c*, pubis; *d*, sacrum; *e*, coccyx; *f*, acetabulum; *g*, thyroid foramen.

**Pembrokeshire**, county, Wales, forming its southwestern angle. It is hilly, but there are many fertile valleys. The coast is rugged and much indented, the chief inlets being Milford Haven, St. Bride's, Newport, and Fishguard bays. Coal, lead, iron, zinc, and slate are mined. The chief town is Pembroke; p. (1921) 91,978.

**Pemmican**, a food preparation used by the North American Indians, which has also been adopted by Arctic and Antarctic expeditions. It consists of the lean parts of beef, buffalo meat, or venison dried, pulverized, and mixed with boiling fat. Dried in the form of cakes, if kept dry it can be preserved indefinitely.

**Pen**, a small instrument employed in writing with ink. The ancient Egyptians, as well as the Chinese and the Japanese, employed the brush for writing; and the calamus, or reed, still used in the East, formed, with papyrus, the true predecessors of modern pen and paper. The Greeks and Romans used the sharp point of the stylus to write on waxen tablets, making erasures with the flattened end of the implement. In the Middle Ages and for a long succeeding period, the usual writing implement was the quill feather. Attempts were made to give durability to the points by gilding them and by attaching to them horn and tortoise-shell. The first steel pen was made in 1803 by one Wise of London; but it was not until about 1830, Perry, Macon, and Gillott of Birmingham began to manufacture them by machinery, that steel pens eventually came into general use. A steel pen goes through about 16 processes, and a gold pen through twice as



many. Birmingham is the chief center of the pen trade in England. The first mechanically manufactured steel pens in the United States were made in New York in 1858. Since that time the pen industry has rapidly increased in importance, the manufacture of fountain pens being particularly important. Pens having an ink barrel which automatically feeds ink to the pen were not successfully manufactured in the United States until about 1869. In 1884 a patent was granted to L. E. Waterman for an automatic underfeed pen and most modern fountain pens are adaptations of this principle. Styles differ considerably. The stylographic pen, which preceded the fountain pen in general use, employs a blunt needle incased in a sheath instead of the regular nibbed pen.

**Penal Code**, a codification of statutes defining and discriminating crimes and misdemeanors, and providing for their punishment and, in some States, for the procedure to be followed. New York and some other States have separate codes of criminal procedure.

**Penal Servitude**, a sentence imposed for the expiation of a crime. When a prisoner convicted of a crime is ordered to confinement for a certain length of time with hard labor he is said to be ordered to penal servitude.

**Penal Statutes**, laws which impose a pecuniary fine or some other penalty or punishment for the breach of their provisions.

**Penalty**, a punishment imposed by the state and fixed by statute for some offence or violation of law.

**Penance**, an ecclesiastical punishment voluntarily accepted as an expression of contrition for sin. It is included among the seven sacraments by the Roman Catholic Church. The Reformers held that the doctrine of justification by faith in Jesus Christ made repentance necessarily followed by Divine forgiveness and therefore no reparation by 'works' was required and Protestants generally held this view.

**Penang**, or **Prince of Wales Island**, a division of the Straits Settlements, at the northern entrance to Strait of Malacca, off the w. coast of Malay Peninsula. Two-thirds of the surface is level. The rainfall is heavy and continuous all the year. The chief products are pepper and other spices, betel nuts (Pulo Pinang—Betel-nut Island), rice, sugar, coconuts, rattans and tin. George Town

is the capital. The island was ceded to the British in 1785; captured by Japan, 1941.

**Penates**, the household gods of the ancient Romans. There were penates of the state as well as of each individual family, the latter being, in fact, its dead ancestors.

**Pencil**, originally a small, fine brush, such as artists still use under the same name, but the term now chiefly connotes the wooden-cased black-lead object and its varieties used in writing and drawing. Conté of Paris invented (1795) a method of combining graphite and clay, which, slightly modified, still prevails. Graphite, the material from which 'lead' pencils are made, is an almost pure form of carbon. The finest graphite in the United States comes from Ticonderoga, New York, and is 99.9 per cent fine.

**Pender, Sir John** (1816-96), Scottish pioneer of submarine telegraphy, was born in the Vale of Leven, Dumbartonshire. He was one of the original subscribers towards the transatlantic cable of 1857-8 and the new cable laid in 1866. To his energy was also due the formation of the Eastern and Eastern Extension Telegraph Companies.

**Pendleton, Ellen Fitz** (1864-1936), American educator. In 1911 she became president of Wellesley college. She resigned 1936. She received many honorary degrees.



*Penguins.*

**Pendleton, George Hunt** (1825-89), American legislator, was born in Cincinnati, O. He was elected to the United States Senate to succeed Stanley Matthews in 1878, and was chairman of the committee which re-

ported the Pendleton Bill to reform the civil service. In 1885-9 he was minister to Germany.

**Pendleton, William Nelson** (1809-83), American clergyman and soldier, was born in Richmond, Va. He was promoted brigadier general in 1862, took a prominent part in the campaigns of the Army of Northern Virginia, and was one of General Lee's commissioners of surrender at Appomattox. After the war he was rector of Grace Church, Lexington, Va., until his death. He published *Science a Witness for the Bible* (1860).

**Pendleton Act, or Civil Service Act**, an act of Jan. 16, 1883, to 'regulate and improve the civil service of the United States.' The act is of great importance in the history of civil service reform in the United States. It created a Civil Service Commission of three members, 'no more than two of whom shall be adherents of the same party,' and the commissioners to be appointed by the President 'by and with the advice and consent of the Senate;' prohibited all political assessments and the appointment of more than two members of any family to positions in the grades covered by the act; and prescribed that clerks, and other employees, in customs offices or in post offices employing as many as fifty persons should be chosen on the basis of competitive examinations to be conducted by the Commission; and empowered the President to extend the merit system from time to time in the treasury, post office, and other executive departments. See CIVIL SERVICE.

**Pendulum**, any rigid body so mounted on an axis is to swing back and forth under the influence of gravity and momentum.

**Penelope**, in ancient Greek legend, the wife of Odysseus. Odysseus left her, with her son Telemachus, when he went to the Trojan War. When the war ended and he still did not return, many suitors claimed her hand. For a long while she put them off, on the plea that she must finish a robe for Laertes, her father-in-law; but every night she unravelled what she had woven in the day. Finally Odysseus appeared, after an absence of twenty years.

**Penfield, Edward** (1866-1925), American artist, was born in New York City, where he studied at the Art Students' League. He early became prominent in the United States as a designer of the impressionistic posters, for the printing of which he devised ingenious methods. From 1891 to 1901 he

was art editor of the Harper periodicals.

**Penfield, William Lawrence** (1846-1909), American lawyer, was born in Dover, Mich. He was Judge of the 35th Circuit of Indiana in 1894-97, and was counsel for the U. S. in the international arbitration case of U. S. *versus* San Domingo, Peru, Haiti, Nicaragua, Guatemala, Salvador and Mexico. He was counsel for the U. S. in the case of Mexico *vs.* U. S. in the 'Pius Fund' case before the Hague Tribunal, and also for the U. S. and Venezuela in the Venezuelan arbitration case before the Hague Tribunal in 1903.

**Penguin**, the common name of an order of birds, the Sphenisciformes. They present some analogy to the auks of the northern hemisphere, with which they were formerly associated; but their nearest relatives are now believed to be the petrels and the divers and grebes. Penguins have no power of flight, their wings being flippers. Since their legs are placed very far back, their gait on land is ludicrous, the birds usually standing upright and waddling with the help of their flippers. The food consists of a variety of marine animals, such as crustaceans, molluscs, fish, and so on, mingled with vegetable matter. The largest of the penguins is the emperor penguins (*Aptenodytes Forsteri*) of Victoria Land and the adjacent seas, which reaches a length of about three feet.

**Penicillin**, a nontoxic, antiinfective substance, of unknown chemical composition, found in mold, and discovered by Prof. Alexander Fleming, a British scientist, in 1929. It became the 'wonder drug' of World War II in 1943. In late 1943 its production increased to mass output, and the price dropped from \$17.20 (in 1942) to \$7.50 per 100,000 units. At the end of World War II it was made available to civilians and could be given by mouth.

**Peninsula Campaign, The**. The name given to the attempt of Gen. George B. McClellan, commanding the Army of the Potomac, to capture Richmond in 1862 by way of the peninsula formed by the York and the James rivers. Gen. McClellan secured the adoption of his plan on March 8, 1862, and on the 17th the first troops embarked for Fortress Monroe. The failure of this campaign caused much depression in the North. See *McClellan's Own Story* (1887); Johnson and Buel, eds., *Battles and Leaders of the Civil War* (1887); Webb, *The Peninsula*



